MULTI-HAZARD MITIGATION PLAN

CLINTON COUNTY, ILLINOIS

Southern Illinois University Carbondale
Department of Geology
Carbondale

ILLINOIS EMERGENCY MANAGEMENT AGENCY
IEMA

Clinton County
Emergency Services
& Disaster Agency

The Polis Center
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Southwestern Illinois Planning Commission

February, 2010

This Multi-Hazard Mitigation Plan was made possible by a grant from the Illinois Emergency Management Agency, which Clinton County hereby gratefully acknowledges.

Hazard Mitigation Plan
Clinton County, Illinois

Adoption Date: -- ______________________ --

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CLINTON COUNTY OFFICIALS

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Bryan Wessel	**John Raymond**
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Joyce Lucas

SUPERVISOR OF ASSESSMENTS
Linda Mensing

HEALTH DEPARTMENT ADMINISTRATOR
Mike McMillan

COUNTY GIS COORDINATOR
Jay Donnelly

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Section 1 - Public Planning Process

1.1 Narrative Description

Hazard Mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from hazards. The Federal Emergency Management Agency (FEMA) has made reducing hazards one of its primary goals. Hazard Mitigation Planning and the subsequent implementation of the projects, measures, and policies developed as part of these plans, is a primary mechanism in achieving FEMA's goal.

The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). The development of a local government plan is a requirement in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs. In order for the National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt an MHMP.

The Clinton County Multi-Hazard Mitigation (MHMP) Planning Committee was established in April of 2008 to define and prioritize the risks in the county and to develop this mitigation plan to minimize both the risks and the consequences of the defined hazards. This team has worked closely on previous mitigation projects such as siren identification and location, area zoning considerations, identification and inventory of hazardous materials, and area training of response personnel. The team will continue to work together to develop and implement mitigation initiatives developed as part of the plan.

In recognition of the importance of planning in mitigation activities, the Federal Emergency Management Agency (FEMA) has created HAZUS-MH (**Haz**ards **US**A **M**ulti-**H**azard) a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict the estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. The Illinois Emergency Management Agency (IEMA) has determined that HAZUS-MH should play a critical role in the risk assessments in Illinois. Southern Illinois University at Carbondale (SIU) and The Polis Center at Indiana University Purdue University Indianapolis (Polis) are assisting Clinton County MHMP Planning Committee with performing the hazard risk assessment.

1.2 Planning Team Information

The Clinton County Multi-Hazard Mitigation Planning Team is headed by Richard Crocker of Clinton County Emergency Services and Disaster Agency (ESDA) as the primary point of contact. Joyce Lucas, the county Zoning Administrator, is the secondary point of contact. Members of the planning team include representatives from Clinton County elected officials and various county departments, cities and villages within the County, and the Regional Planning Commission. Table 1-1 identifies the planning team individuals and the organizations they represent.

Table 1-1: Multi Hazard Mitigation Planning Team

Name	Title	Organization	Jurisdiction Represented
Richard Crocker	*Coordinator*	*Emergency Services & Disaster Agency*	*Clinton County, City of Carlyle*
Kevin Terveer	*Executive Director*	*Southwestern Illinois Metropolitan and Regional Planning Commission*	*Southwestern Illinois Region*
Linda Tragesser	*Community Planner*	*Southwestern Illinois Metropolitan and Regional Planning Commission*	*Southwestern Illinois Region*
Ray Kloeckner	*Chairman*	*County Board*	*Clinton County,*
Neal Richter	*County Engineer*	*Highway Department*	*Clinton County*
Jay Donnelly	*Coordinator*	*Clinton County GIS*	*Clinton County, City of Carlyle*
John Skain	*Chairman*	*County 911 Board*	*Clinton County*
Todd Peppenhorst	*Staff*	*Emergency Services & Disaster Agency*	*Clinton County*
Joyce Lucas	*Zoning Administrator*	*County Zoning Office*	*Clinton County, Village of Albers*
Derek Sudholt	*Village President*	*Aviston Village Board*	*Village of Aviston*
Larry Harper	*Trustee*	*Aviston Village Board*	*Village of Aviston*
Mike Buscher			*Village of Aviston*
Gary Rakers	*Public Works*	*Aviston*	*Village of Aviston*
Jack Wilken	*Village President*	*Bartelso Village Board*	*Village of Bartelso*
Tim Foehne	*Public Works*	*Bartelso*	*Village of Bartelso*
Rodney Rakers	*ESDA Coordinator*	*Beckemeyer*	*Village of Beckemeyer*
Ken McElroy	*Chief*	*Beckemeyer*	*Village of Beckemeyer*
Timothy Schleper	*Director*	*Public Works Department*	*City of Breese*
Robert Fix	*Board Member*	*Clinton County Board*	*City of Breese*
Steven Heligenstein	*Board Member*	*Clinton County Board*	*City of Carlyle*
Linda Mensing	*Supervisor of Assessments*	*Clinton County*	*City of Carlyle*
Greg Dodson	*Lieutenant*	*Centralia Police Department*	*City of Centralia*
Larry Evans	*Police Chief*	*Centralia Police Department*	*City of Centralia*
Bud Jansen	*Village President*	*Damiansville Village Board*	*Village of Damiansville*
Ruth Jansen		*Damiansville Village Board*	*Village of Damiansville*
Francis Billhartz	*Trustee*	*Damiansville Village Board*	*Village of Damiansville*
Norman Horstman	*Trustee*	*Damiansville Village Board*	*Village of Damiansville*
Gerald Kohnen	*Village President*	*Germantown Village Board*	*Village of Germantown*
William Guile	*Village President*	*Hoffman Village Board*	*Village of Hoffman*
Jonathan Tucker	*Village President*	*Huey Village Board*	*Village of Huey*
Tom La Caze	*County Clerk*	*Clinton County*	*Village of New Baden*
James Sullivan	*Board Member*	*Clinton County Board*	*City of Trenton*
Cindy Dawson	*Emergency Mgmt Services*	*City of Trenton*	*City of Trenton*
Darlene Ewers	*Emergency Mgmt Services*	*City of Trenton*	*City of Trenton*
Michael Jones	*Police Chief*	*Trenton Police Department & EMS*	*City of Trenton*

The Disaster Mitigation Act (DMA) planning regulations and guidance stress that planning team members must be active participants. The Clinton County MHMP committee members were actively involved on the following components:

- Attending the MHMP meetings
- Providing available Geographic Information System (GIS) data and historical hazard information
- Reviewing and providing comments on the draft plans
- Coordinating and participating in the public input process
- Coordinating the formal adoption of the plan by the county

An MHMP kickoff meeting was held at the Clinton County Annex in the Board Room on April 29, 2008. Representatives of Clinton County, Bond County, and SIMAPC attended the meeting. Nicholas Pinter of SIU-C explained the rationale behind the MHMP program and answered questions from the participants.

Jonathan Remo from SIU provided an introduction to hazards, and Dan Coats and John Buechler from The Polis Center provided an overview of HAZUS-MH. Professor Pinter described the timeline and the process of the mitigation planning project and presented Clinton County and Bond County with a Memorandum of Understanding (MOU) for sharing data and information.

The Clinton County ESDA Coordinator and County Board Chairman, working with Southwestern Illinois Metropolitan and Regional Planning Commission (SIMAPC), organized the committee between April and October in 2008, and began gathering the data that would be needed for risk assessment. Six meetings (including the kick-off meeting) would be needed for the project. The four phases of the planning process were planned as follows:

PHASE 1: Organization of Resources

PHASE 2: Risk Assessment

PHASE 3: Development of a Mitigation Plan

PHASE 4: Implementation of the Plan and the Monitoring of Programs

The representative of SIMAPC and the Clinton County ESDA assigned tasks to committee members. The committee determined from the information provided by the Polis Center and SIU-C that five additional meetings would be held for the following tasks and purposes:

Meeting #2 – Discuss Public Participation and review initial critical facilities data

Meeting #3 – Prioritize identified Hazards and profile the Hazards for modeling

Meeting #4 – Present the draft Risk assessment document and the SIU-C Hazard presentation

Meeting #5 – Develop Mitigation Strategies

Meeting #6 – Presentation of Draft Plan and discussion of any changes recommended

The date set for completion of the draft plan was August 30, 2009. By November, 2008 the Clinton County ESDA Coordinator and County Board Chairman had appointed additional members to the committee including a representatives from key County departments as well as representatives from each of the fourteen incorporated municipalities within the County. Committee members had accumulated data concerning many of the county critical facilities, and had forwarded this data to the SIUC for inclusion in their risk assessment process.

The Clinton County Multi-Hazard Mitigation Planning Committee met on the following dates:

- December 2, 2008 at 2:00 p.m.
- May 5, 2009 at 2:00 p.m.
- June 23, 2009 at 7:00 p.m.
- September 2, 2009 at 2:00 p.m.
- December 2, 2009 at 2:00 p.m.

These meetings were held in Carlyle, Illinois at the County Board Room. Each meeting was approximately two hours in length. The meeting agendas, minutes, and attendance sheets are included in Appendix A. During these meetings, the planning team successfully identified critical facilities, reviewed hazard data and maps, identified and assessed the effectiveness of existing mitigation measures, established mitigation projects, and assisted with preparation of the public participation information.

1.3 Public Involvement in Planning Process

An effort was made to solicit public input during the planning process and a public meeting was held during the formation of the plan on June 23, 2009. Notices concerning the public meeting were published in the ***Centralia Daily Sentinel*** and the ***Breese Journal.*** Appendix A contains the agendas and minutes from each of the public meetings. Appendix B contains articles published by the local newspaper throughout the public input process.

1.4 Neighboring Community Involvement

The Clinton County planning team invited participation from various representatives of county government, local city and town governments, community groups, local businesses, and universities. The initial planning meeting held in April, 2008 included representatives from the adjacent county of Bond. The team also sought input and comment from the adjacent jurisdictions of Bond, Madison, St. Clair and Washington counties, as well as the East-West Gateway Council of Governments in order to obtain their involvement in the planning process and provide for a regional review. Details of neighboring stakeholders' involvement are summarized in Table 1-2.

Table 1-2: Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Organization	Participation Description
Rick Greten	Washington County	Washington County ESDA and Washington County Zoning	Neighboring county – reviewed plan and provided comments.
Allan Davis	Bond County	Bond County Emergency Management Agency	Neighboring county – reviewed plan and provided comments.
Robert Knight	St. Clair County	St. Clair County Emergency Management Agency	Neighboring county – reviewed plan and provided comments.
Frank Miles	Madison County	Madison County Planning and Development Department	Neighboring county – reviewed plan and provided comments.
Gary Pondrom	East West Gateway Council of Governments	East-West Gateway Council of Governments	Regional Review

1.5 Review of Technical and Fiscal Resources

The MHMP planning team has identified representatives from key agencies to assist in the planning process. Technical data, reports, and studies were obtained from these agencies. The organizations and their contributions are summarized in Table 1-3.

Table 1-3: Key Agency Resources Provided

Agency Name	Resources Provided
Clinton County Supervisor of Assessments and GIS Department	Tax System Data Base, Parcel Map, Ortho Map
Illinois Emergency Management Agency	Illinois 2007 Natural Hazard Mitigation Plan
U.S. Army Corps of Engineers	Provided reports about existing land subsidence issue
Illinois Department of Natural Resources, Div. of Water	Watershed and stream data
Illinois Department of Employment Security	Economic and Demographic Data
East-West Gateway Council of Governments	Regional Demographic and Economic Data
US Department of Commerce, Bureau of the Census	Demographics and Physical Characteristics, 2007 Census of Agriculture, County Business Patterns
United States Geological Survey	Land Cover, Topography
Illinois Department of Commerce and Economic Opportunity	Economic Data and Community Profiles
US Department of Agriculture, National Resources Conservation Services	Soils and Geological data, Physical Characteristics
US Bureau of Economic Analysis	2007 Personal Income By County
Illinois State Geographical Survey	Topography, Physiography, Coal Mining
Illinois State Climatologist	Climate Data
National Climatic Data Center	Climate Data

Illinois Environmental Protection Agency	Illinois 2008 Section 303(d) Listed Waters and watershed maps.
Agency Name	**Resources Provided**
Southwestern Illinois Resource Conservation and Development	Conservation Data
Federal Emergency Management Agency (FEMA)	Flood Hazard Information
Southwestern Illinois Metropolitan and Regional Planning Commission	Future Land Use Plan 2012 of Clinton County, Future Land Use and Transportation of Bond County,
Regional Commerce and Growth Association (St. Louis Chamber)	Business Data, Demographics
U S Army Corps of Engineers	History of Carlyle Lake, Kaskaskia River Project 1957

1.6 Review of Existing Plans

Clinton County has a tradition of community development planning. The County and its associated local communities utilize a variety of planning documents to direct community development. These documents include land use plans, master plans, emergency response plans, municipal ordinances, and building codes. The MHMP planning process incorporated the existing natural hazard mitigation elements from previous planning efforts. Table 1-4 lists the plans, studies, reports, and ordinances used in the development of the plan.

Table 1-4: Planning Documents Used for MHMP Planning Process

Author(s)	Year	Title	Description	Where Used
Southwestern Illinois Metro & Regional Planning Commission	2003 – 2008	Comprehensive Economic Development Strategy (CEDS)	Lists economic and community projects for local governments. Includes mitigation to prevent developing in floodplain and building safer structures to withstand a potential earthquake.	Mitigation strategies from this plan were incorporated
Southwestern Illinois Metro & Regional Planning Commission	2001	Clinton County 2012 Future Land Use Plan	Comprehensive plan for land use, transportation, and public facilities.	Sections related to hazards incorporated into MHMP.
Southwestern Illinois Metro & Regional Planning Commission	2000	City of Breese Comprehensive Plan	Comprehensive plan for land use, transportation, and public facilities.	Sections related to hazards incorporated into MHMP
Clinton County	2004	Revised Code of Ordinances of Clinton County Illinois	This codebook includes ordinances for floodplain, and planning / zoning.	These ordinances were considered for MHMP because they are designed to mitigate hazards.
State of Illinois Emergency Management Agency	2007	2007 Illinois Natural Hazard Mitigation Plan	The INHMP lays out the process for identifying and mitigating natural hazard threats reasonably expected in the State of Illinois according to requirements of the Disaster Mitigation Act of 2000	Guidance on hazards and mitigation measures, topography and other geologic information
Arcturis	2007	City of Centralia	Comprehensive plan for land	Sections related to hazards

		Comprehensive Plan	use, transportation, and public facilities.	incorporated into MHMP
Author(s)	**Year**	**Title**	**Description**	**Where Used**
City of Carlyle	2009	City of Carlyle Strategic Plan	Lays out History and explores strengths/weakness of City	History and Background
Economic Development Resources (EDR)	2004	City of Trenton Comprehensive Plan	Comprehensive plan for land use, transportation, and public facilities.	Sections related to hazards incorporated into MHMP
Village of Albers		Village of Albers Land Use and Transportation Plan	Comprehensive plan for land use, transportation, and public facilities.	Sections related to hazards incorporated into MHMP
Village of Aviston		Village of Aviston Comprehensive Plan	Comprehensive plan for land use, transportation, and public facilities.	Sections related to hazards incorporated into MHMP

Section 2 - Jurisdiction Participation Information

The jurisdictions included in this multi-jurisdictional plan are listed in Table 2-1.

Table 2-1: Participating Jurisdictions

Jurisdiction Name	Chief Elected Official
County of Clinton	Honorable Ray Kloeckner, County Board Chairman
Village of Albers	Honorable Steve Schomaker, Village President
Village of Aviston	Honorable Derek Sudholt, Village President
Village of Bartelso	Honorable John B. Wilken, Village President
Village of Beckemeyer	Honorable Mike Stock, Village President
City of Breese	Honorable Charles E. Hilmes, Mayor
City of Carlyle	Honorable Jan Fauke, Mayor
City of Centralia	Honorable Becky Ault, Mayor
Village of Damiansville	Honorable Herman Jansen, Jr., Village President
Village of Germantown	Honorable Gerald Kohnen, Village President
Village of Hoffman	Honorable William Guile, Village President
Village Huey	Honorable Jonathan Tucker, Village President
Village of New Baden	Honorable Mike Brandmeyer, Village President
City of Trenton	Honorable Gary Sellars, Mayor

* Keyesport is a municipality located within both Clinton County and Bond County and is participating in the Bond County Hazard Mitigation plan. Wamac is a community that lies primarily within Marion County with less than 10% of the population in Clinton County.

2.1 Adoption by local governing body

The draft plan was made available on December 2, 2009 to the planning team and other agencies including Bond County ESDA, St. Clair County EMA, Washington County ESDA, Madison County Planning and Development, and East West Gateway Council of Governments for review. Comments were then accepted. The Clinton County Hazard Mitigation Planning team presented and recommended the plan to Clinton County Board, and the Clinton County Multi-Hazard Mitigation Plan was subsequently adopted on ________________. Resolution adoptions are included in Appendix C of this plan.

2.2 Jurisdiction Participation

It is required that each jurisdiction participates in the planning process. Table 2-2 lists each jurisdiction and describes its participation in the construction of this plan.

Table 2-2: Jurisdiction Participation

Jurisdiction Name	Participating Members	Participation Description
Clinton County	Ray Kloeckner, County Board Chairman	Member, MHMP planning committee
Clinton County	Richard Crocker, ESDA Coordinator	Member, MHMP planning committee
Clinton County	Neal Richter, Highway Department	Member, MHMP planning committee
Clinton County	John Skain, County 911 Board	Member, MHMP planning committee
Clinton County	Todd Peppenhorst, ESDA	Member, MHMP planning committee
Clinton County	Jay Donnelly, GIS Coordinator	Member, MHMP planning committee
City of Breese	Timothy Schleper	Member, MHMP planning committee
City of Breese	Robert Fix	Member, MHMP planning committee
Village of Albers	Joyce Lucas	Member, MHMP planning committee
Village of Aviston	Derek Sudholt,	Member, MHMP planning committee
Village of Aviston	Larry Harper,	Member, MHMP planning committee
Village of Aviston	Mike Buscher ,	Member, MHMP planning committee
Village of Aviston	Gary Rakers,	Member, MHMP planning committee
Village of Bartelso	Jack Wilken	Member, MHMP planning committee
Village of Bartelso	Tim Foehne	Member, MHMP planning committee
Village of Beckemeyer	Rodney Rakers	Member, MHMP planning committee
Village of Beckemeyer	Ken McElroy	Member, MHMP planning committee
City of Carlyle	Steve Heiligenstein	Member, MHMP planning committee
City of Carlyle	Linda Mensing	Member, MHMP planning committee
City of Centralia	Greg Dodson	Member, MHMP planning committee
City of Centralia	Larry Evans	Member, MHMP planning committee
Village of Damiansville	Bud Jansen	Member, MHMP planning committee
Village of Damiansville	Ruth Jansen	Member, MHMP planning committee
Village of Damiansville	Francis Billhartz	Member, MHMP planning committee
Village of Damiansville	Norman Horstman	Member, MHMP planning committee
Village of Germantown	Gerald Kohnen	Member, MHMP planning committee
Village of Hoffman	William Guile	Member, MHMP planning committee
Village of Huey	Jonathan Tucker	Member, MHMP planning committee
Village of New Baden	Tom LaCaze	Member, MHMP planning committee
City of Trenton	Cindy Dawson	Member, MHMP planning committee
City of Trenton	Darlene Ewers	Member, MHMP planning committee
City of Trenton	James Sullivan	Member, MHMP planning committee
City of Trenton	Michael Jones	Member, MHMP planning committee
Southwestern Illinois Region	Kevin Terveer, SIMAPC Exec. Dir.	Member, MHMP planning committee
Southwestern Illinois Region	Linda Tragesser, SIMAPC Community Planner	Member, MHMP planning committee

Section 3 - Jurisdiction Information

Settlers first arrived in what is now Clinton County in approximately 1808 when a wagon road, the Goshen Road, was laid out across the area from Alton to Shawneetown. This wagon road crossed the Kaskaskia River at a natural ford resulting from the hard river bottom near the point where the City of Carlyle is now situated. Later, a prairie fort was constructed at the Carlyle site which afforded settlers protection from Native American attacks. The historic General Dean Bridge was constructed in 1859 a the spot where the natural ford in the river is situated. The General Dean Bridge is the only suspension bridge of its kind in the State of Illinois.

Clinton County was formally organized in 1824 out of Washington, Fayette and Bond Counties and was named in honor of DeWitt Clinton. The County consists of a largely rural population and agriculture is the chief occupation with corn, wheat, and soybeans being the staple products. The city of Carlyle is the county seat.

Frequent flooding of the Kaskaskia River eventually led to formation of the Kaskaskia River Valley Project in 1933, along with a subsequent organization, the Kaskaskia Valley Association in 1952, whose efforts eventually led to authorization for the US Army Corps of Engineers in the Federal Flood Control act of 1958 to develop the dam at Carlyle and the impoundment of a major reservoir. Work on the dam and lake was completed in 1967 and resulted in Carlyle Lake, the largest man-made lake in the State of Illinois at 26,000 acres, being fifteen miles long and three and one-half miles wide. With flat water recreation, four marinas, a sail-boat harbor, and 11,000 acres of recreational public land, Carlyle Lake is the second-largest tourism attraction in the state with 2.9 million visitors per year.

Agriculture has traditionally been the mainstay of the economy of the County, and remains so today. Coal mining and petroleum have also traditionally been pursued, but have waned in the County during the last few decades. The most populous municipalities are Breese, Carlyle, Centralia, New Baden, and Trenton. Transportation assets include Interstate 64 which traverses the southwestern corner, State Highways IL-4, IL-127, IL-160, IL-161, IL-177, and US Highway 50. Four different rail lines operate in the County.

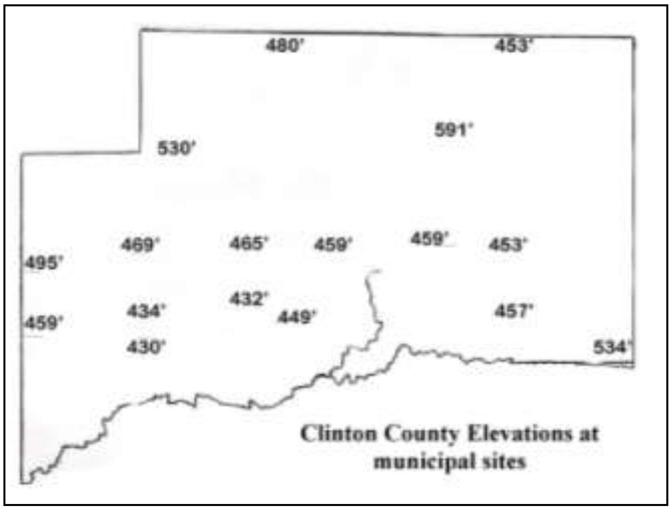
3.1 Topography


Clinton County

Clinton County is located in the southwestern region of Illinois about 30 miles east of the St. Louis Metropolitan area. It has an area of approximately 503 square miles of which 474 square miles are land and 29 square miles are covered by water. It is bordered on the northwest by Madison County; on the north by Bond, and Fayette Counties; on the east by Marion County; on the west by St. Clair County, and on the south by the Kaskaskia River and Crooked Creek which separate Clinton County from Washington County. Elevations in Clinton County range from 385 feet above sea level in the southwest part near the Kaskaskia River, to 588 feet above sea level in the area near the City of Carlyle.

The area now known as Clinton County lies entirely within the flat to gently rolling topography of the Central Lowland Province, Springfield Plain sub-Section of the Till Plains Section physiographic division of Illinois. It was covered by sheets of ice during the Illinoian Glaciation. When the glaciers receded they deposited glacial drift debris and glacial till, and left the land basically flat with a pattern of elongated ridges. Elevations in the county range from 385 feet above mean sea level in the southwest, 400 ft above mean sea level at several stream locations in the south-central portions part near the Kaskaskia River, 534 ft. above mean sea level near the City of Centralia, 588 feet above sea level in an area north of the City of Carlyle and 580 ft. to 591 ft. in the north central portion of the County in Wheatfield and Irishtown Townships.

Figure 3-1: Elevations in Clinton County



Municipality	Elevation
Albers	434 feet
Aviston	469 feet
Bartelso	449 feet
Beckemeyer	459 feet
Breese	465 feet
Carlyle	459 feet
Centralia	534 feet
Damiansville	430 feet
Germantown	432feet
Hoffman	457 feet
Huey	453 feet
Keyesport	453 feet
New Baden	459 feet
Trenton	495 feet
Wamac	500 feet

More than seventy percent of the lands have a slope of less than 2 percent. Of the remainder, slightly less than 20 percent of the lands are gently sloping, and about 10 percent have a relatively steep slope of 5 percent or more. More than seventy-five percent of the soils formed in loess, the windblown material that covers much of the glacial till plains. The remainder of the soils formed in alluvial material transported by water and deposited on flood plains during flooding. Clinton County is drained by the Kaskaskia River and by Shoal, Crooked, Sugar and Beaver Creeks, which are responsible for much of the deposits found in the valleys and the stream terraces. The General Soils Associations in the county are Hoyleton-Darmstadt-Cisne, Oconee-Cowden-Darmstadt, Herrick-Virden-Piasa, Blair-Muren-Iva, Bluford-Hickory-Blair, Wakeland-Birds-Beaucoup, and Wagner-Racoon-Lakaskia. Its geological formation is similar to that of other counties in the same section. Thick layers of limestone lie near the surface, with coal seams underlying the same at varying depths. The soil is varied, being at some points black and loamy and at others (under timber) decidedly clayey.

3.2 Climate

Clinton County's climate is typical of Southwestern Illinois. The variables of temperature, precipitation, and snowfall can vary greatly from one year to the next. Winter temperatures can fall below freezing starting as early as October and extending as late as April. Based on National

Climatic Data Center (NCDC), average temperatures from 1971 to 2000, in winter, on average the lowest normal winter temperature, occurring in January, is 18.8° F, and the average normal high, occurring in March, is 53.7° F. In summer, the average normal low, occurring in June, is 62.1° F and average normal high, occurring in July is 87.7° F. Average annual precipitation is 40.64 inches throughout the year. The list below provides the complete data from the National Climatic Data Center for Clinton County.

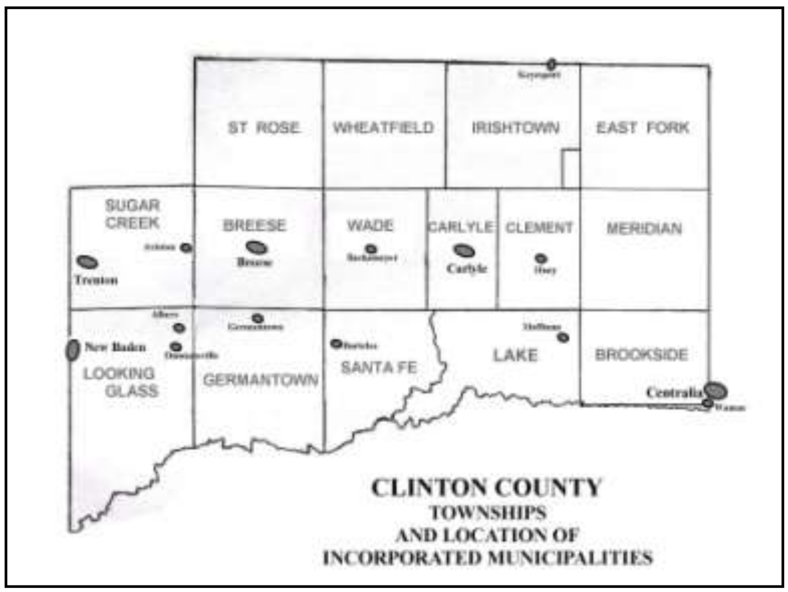
3.3 Demographics

The United States Census Bureau has estimated the 2007 population of Clinton County at 36,450. At the 2000 Census the county had a population of 35,535 with a density of 75 per square mile. Between the 1990 Census and the 2000 Census its population increased by 4.69%. The average household size is 2.60 persons compared to an average state family size of 3.10 persons. The County's largest municipality is Centralia, although much of Centralia's populated area lies in the adjoining county of Marion. Breese, Carlyle, and Trenton are the most populous municipalities lying entirely within Clinton County.

The County population is spread out through fifteen townships including:

Township	2007 Estimated Population
Breese	5,279
Brookside	5,446
Carlyle	3,905
Clement	516
East Fork	426
Germantown	1,986
Irishtown	1,061
Lake	962
Looking Glass	5,874
Meridian	623
St. Rose	1,332
Santa Fe	1,127
Sugar Creek	5,587
Wade	1,754
Wheatfield	572

Figure 3-2: Clinton County Townships



Source: Southwestern Illinois Metropolitan and Regional Planning Commission

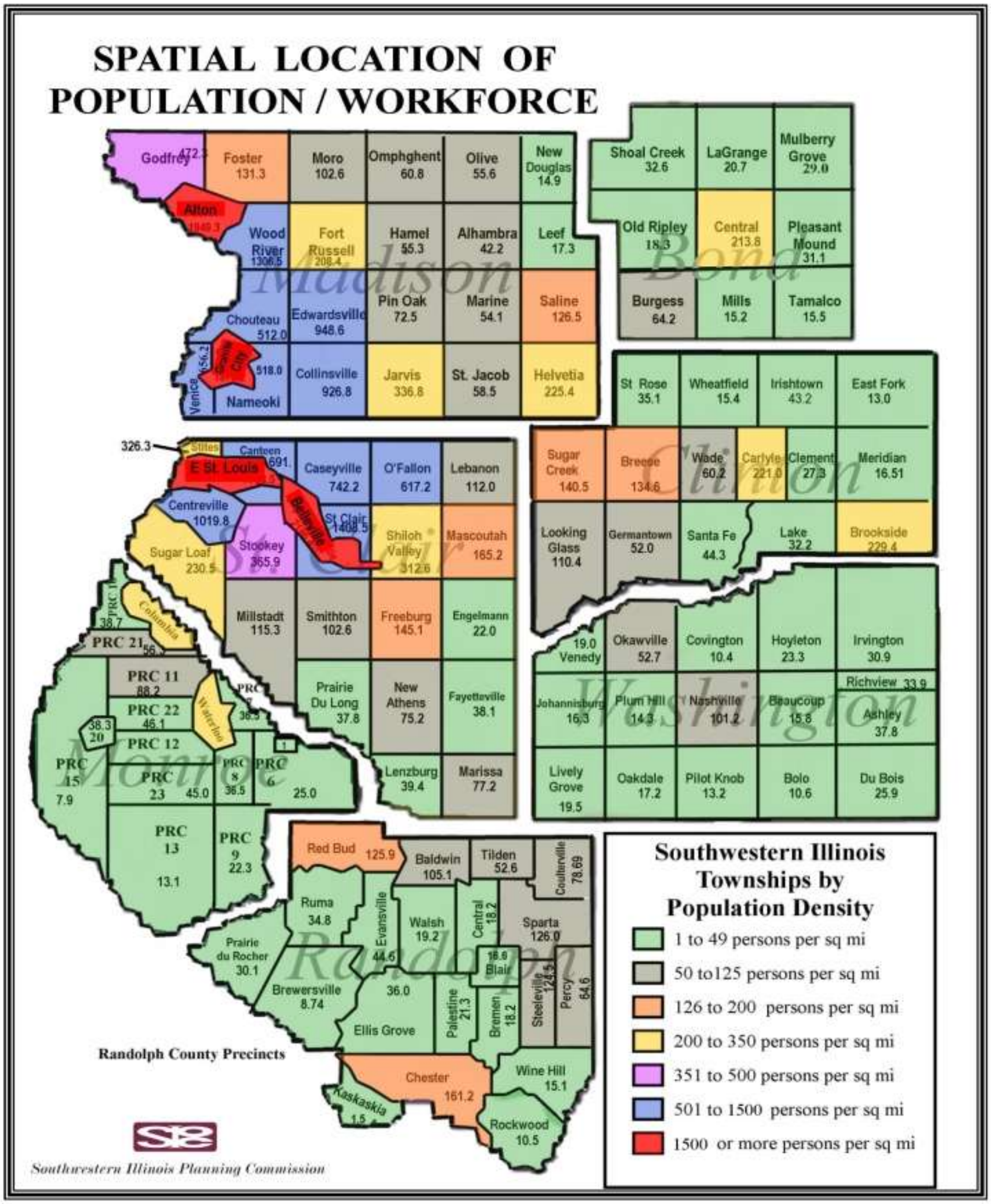
The 2000 Census also shows the County's population is spread out by age with 24.9% under the age of eighteen, and 14.4% over the age of 65. The median age was 37 years. There were 12,754 households, 13,805 housing units, and the housing density was 29 units per square miles. The breakdown of population by incorporated areas is included in Table 3-1.

Table 3-1: Population by Community

Community	2007 Population Estimate	% of County
Clinton County	**36,450**	**100%**
Village of Albers	1,069	2.9%
Village of Aviston	1,679	4.6%
Village of Bartelso	583	1.5%
Village of Beckemeyer	1,083	2.9%
City of Breese	4,310	11.8%
City of Carlyle	3,369	9.2%
City of Centralia	13,583	*
Village of Damiansville	395	1.1%
Village of Germantown	1,223	3.4%
Village of Hoffman	449	1.2%
Village of Huey	185	.05%
Village of Keyesport	468	*
Village of New Baden	3,173	*
City of Trenton	2,643	7.3%
City of Wamac	1,275	*

Source: American FactFinder , *2007 Population Estimates*
*The communities of Centralia, Keyesport, New Baden, and Wamac lie in more than one county, and their Clinton County population is not discernible in the American Fact Finder 2007 population estimate. The population figures shown for those Cities include persons living in adjoining counties.

Figure 3-3: Spatial Distribution of Population and Workforce in Southwestern Illinois



3.4 Economy

Illinois MapStats reported a Clinton County civilian work force of 19,351 for 2006, and that 9,308 (48.1%) of the workforce in Clinton County were employed in the private sector. The breakdown is included in Table 3-2. Educational and Health Services represents the largest sector, employing approximately 21.3% of the workforce. The 2007 annual personal income in Clinton County was $1,235,703,000 according to the Bureau of Economic Analysis of the US Department of Commerce. Based upon the July 1, 2007 estimate of population from the Census Bureau the annual per capita income estimate for the county would be $33,901 compared to an Illinois average of $40,926 based upon the same time frame and data sources.

Table 3-2: Industrial Employment by Sector

Industrial Sector	% of County Workforce (2004 Base year)	
Agriculture, forestry, fishing, hunting, and mining	3,392	(21.1%)
Construction	1,195	(7.4%)
Manufacturing	1,163	(7.2%)
Wholesale trade	531	(3.3%
Retail trade	1,903	(11.8%)
Transportation, warehousing and utilities	493	(3.1%
Professional and Business Services	432	(2.7%)
Information	158	(.98%)
Finance, insurance, real estate, and rental/leasing	528	(3.3%
Administrative & Waste management services	96	(.6%)
Educational, health, and social services	3,426	(21.3%)
Arts, entertainment, recreation, accommodation and food services	1,026	(6.4%)
Personal and other services(except public administration)	495	(3.1%
Public administration (Government excluding Post Office, Educ., & Hospital)	1,335	(8.3%)
Total all industries: 16,078		

Source: http://lmi.ides.state.il.us/projections/countyfiles/lt/industry/Clinton.xls, accessed 12/15/08

3.5 Industry

Clinton County's major employers and number of employees are listed in Table 3-3. The largest employers are Maschoff's Inc. in the unincorporated area south of Carlyle, Jim's Formal Wear in Trenton, the Centralia Correctional Center, and Saint Joseph's Hospital and Arrow Industries, both of which are located in the City of Breese. The number of employees at these locations range from 450 at Maschoff's to roughly 250 at Arrow Industries.

Education, Health, and Government is the largest industrial sector in Clinton, followed by Agriculture. Manufacturing, retail, and transportation follow in terms of the number of persons employed.

Table 3-3: Major Employers

Company Name	Location	NAICS CODE	Date Estab	Employees	Type of Business
Manufacturing					
Arrow Group Industries	Breese	332		250+	Fabricated Metal Products
B & M Seating	Carlyle	336		100+	Transportation Equipment
L & P Plastics	Carlyle	326	1986	100+	PlasticsFabricating/Finish/Decor
Transportation					
Beelman Truck	Carlyle	336	1906	100+	Truck Transportation
Information Technology					
Breese Journal & Publishing	Breese	511	1925	175	Publishing Industries
Construction and Specialty Trades					
Kehrer Brothers	Albers	238		100+	Roofing Contractors
Agriculture					
Maschoffs Inc.	Carlyle	111	2003	450	General Farms, Primarily crop/Pork
Wholesale and Retail					
Jim's Formal Wear	Trenton	448	1964	400	Mens' Clothing
Education and Health, Government					
St. Joseph's Hospital	Breese	622		300	Hospitals
Wesclin CU School Dist.	Trenton	610		100+	Elementary & Secondary Schools
Breese Nursing Home	Breese	623		100+	Nursing & Residential Care Facility
Centralia Correctional Center	Centralia			350	State Correctional Facility

Source: Illinois Workforce Information Center, http://wic.ilworkinfo.com/analyzer/empseldata.asp, accessed 12/15/2008
St. Louis Regional Chamber and Growth Association, http://www.gotostlouis.org/x274.xml, accessed 4/28/09
Illinois MapStats, 2008

3.6 Land Uses and Development Trends

Like much of Illinois, Clinton County has some of the most productive farmland in nation. Agriculture has been the dominant land use in the County for decades. As a predominantly family-owned industry, agriculture continues to play a vital role in the County's economy. The trend toward farm specialization and bigger and bigger equipment has changed the face of agriculture in the County, as it has for the nation as a whole. Fewer farms are found in Clinton County today, yet the size of individual farms is decidedly larger. The Illinois Department of Agricultural reports that there are 236,508 acres, or 369.5 square miles, of agricultural land in Clinton County representing 73.4% of the total land area. This acreage is roughly evenly split between Corn and Soybean except for 5% in Winter wheat, 3% in other small grains and hay, 9% double-cropped in wheat and soybeans, and 7% in rural grassland.

Clinton County contains more bottomland forest than any other county in Illinois with 9,667 acres. The County also ranks first in wetland acreage having 40,698 acres, and ranks third in acreage covered by open water having 19,334 acres (mostly in lakes or rivers).

Urban and built up land constitutes 16.9%, or 13,601 acres, and of that total 3,975 acres are high density municipal areas. Residential is the second largest land use in the County in terms of impact. The predominant housing type in the unincorporated areas is single-family detached housing. Recent trends reflect an increase in the number and size of homes, and demographic data reflects that Clinton County is following the national trend of smaller household size. As a result, more land is being used to accommodate fewer people. Population growth in the County has raised some concern about the spread of scattered residential subdivisions and the future of agriculture. The County's Future Land Use Plan adopted in assumes a moderate growth rate of roughly 10% over ten years, and recommends the County strive to conserve agricultural areas, maintain a strong residential base, diversify the local economy, and direct major commercial and residential development into areas identified for growth surrounding the existing communities. The land use maps from the Comprehensive Plans for Clinton County, the City of Breese, the City of Trenton, and the City of Centralia are included on the following pages.

Figure 3-4 Clinton County Land Use and Transportation Plan

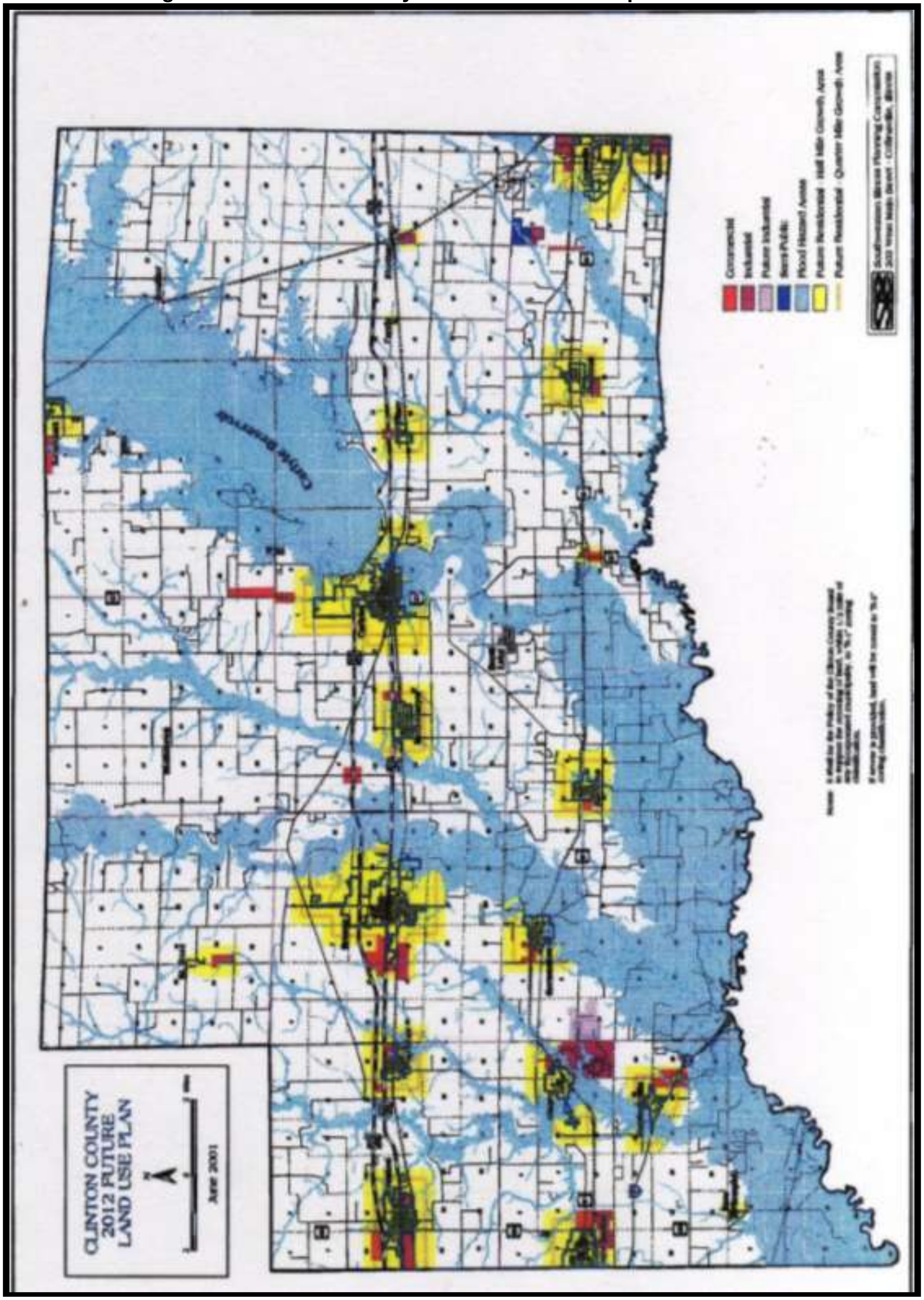


Figure 3-5: City of Breese Land Use and Transportation Plan

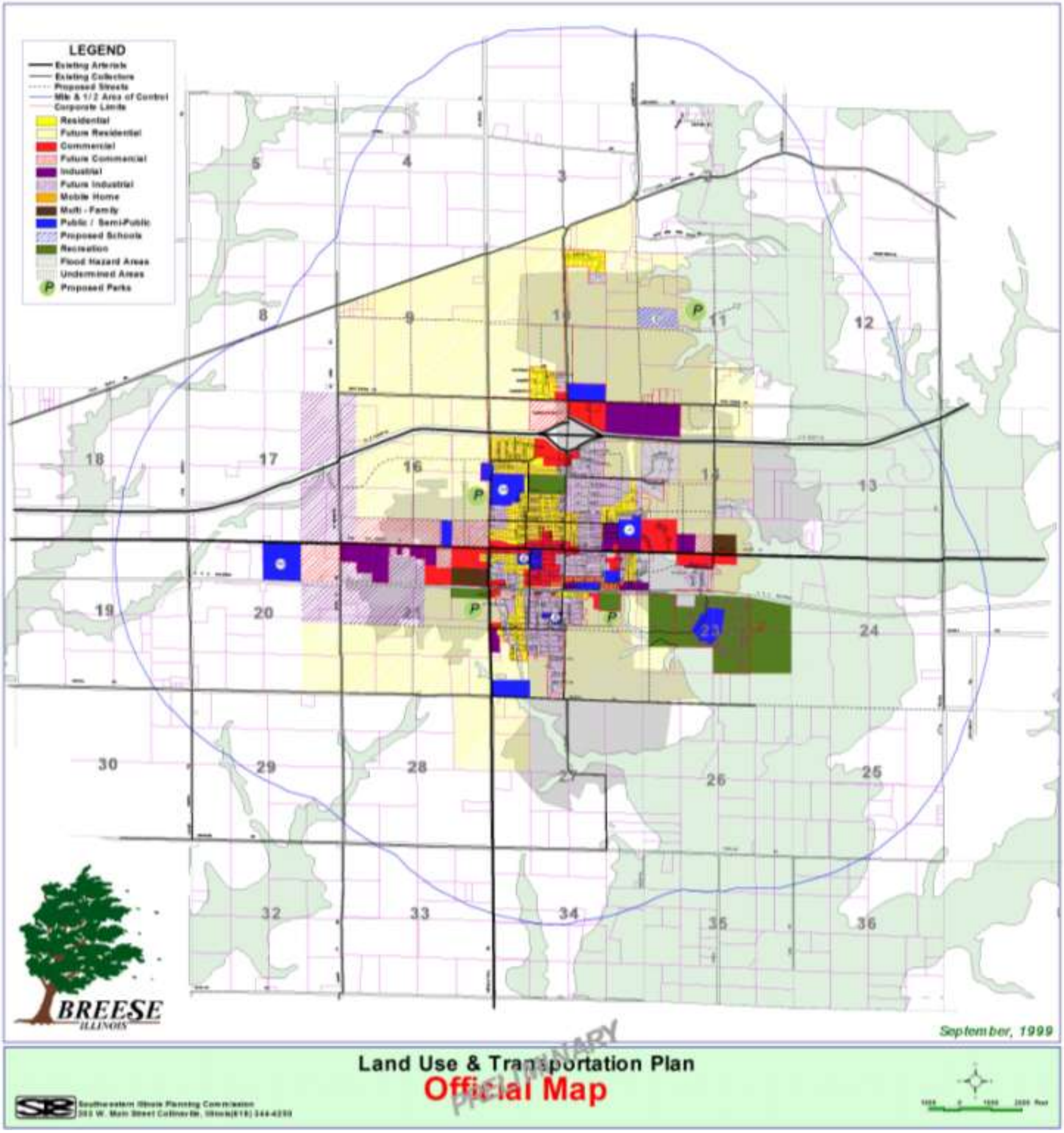


Figure 3-6: City of Trenton Future General Land Use Plan

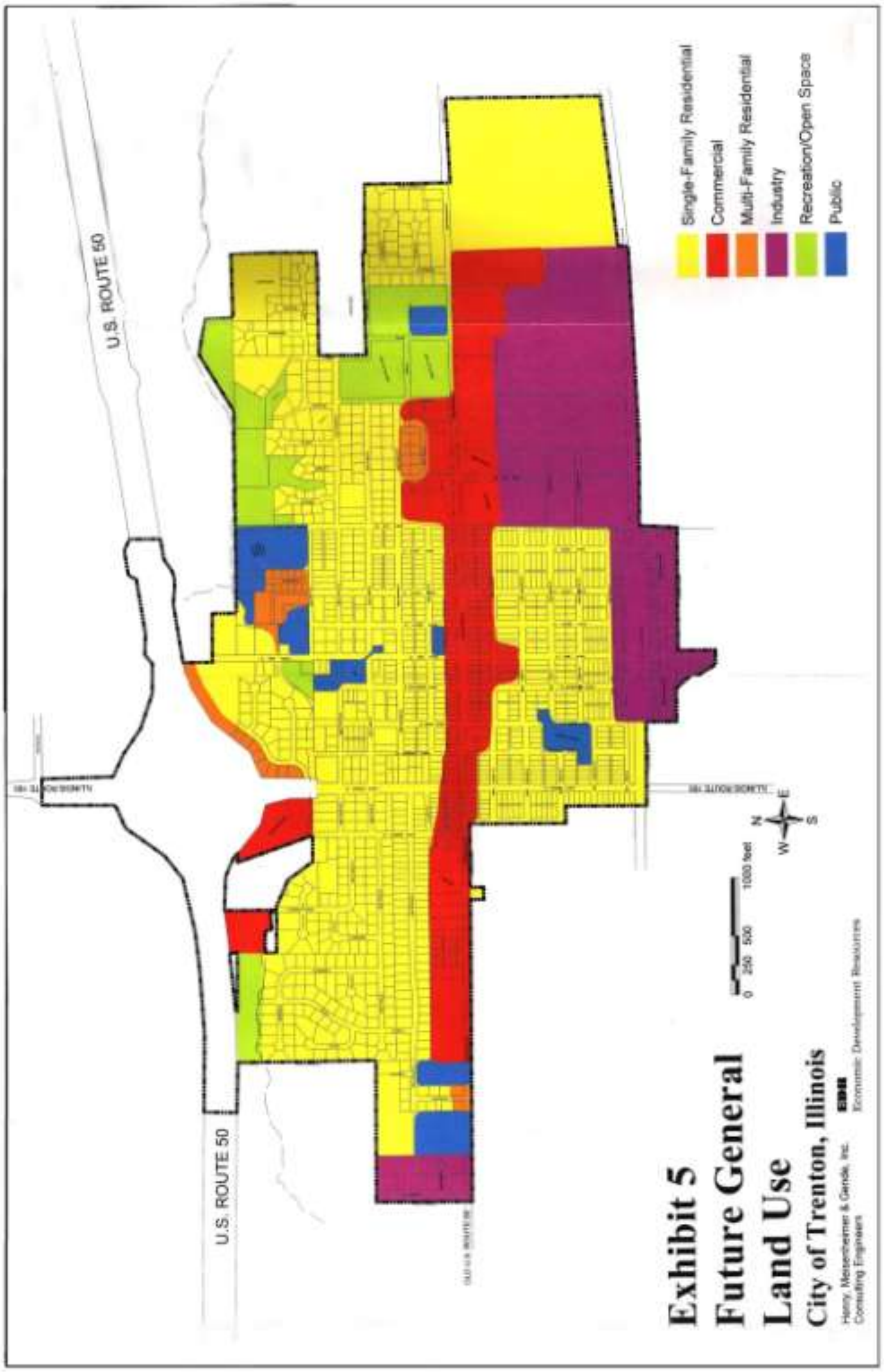
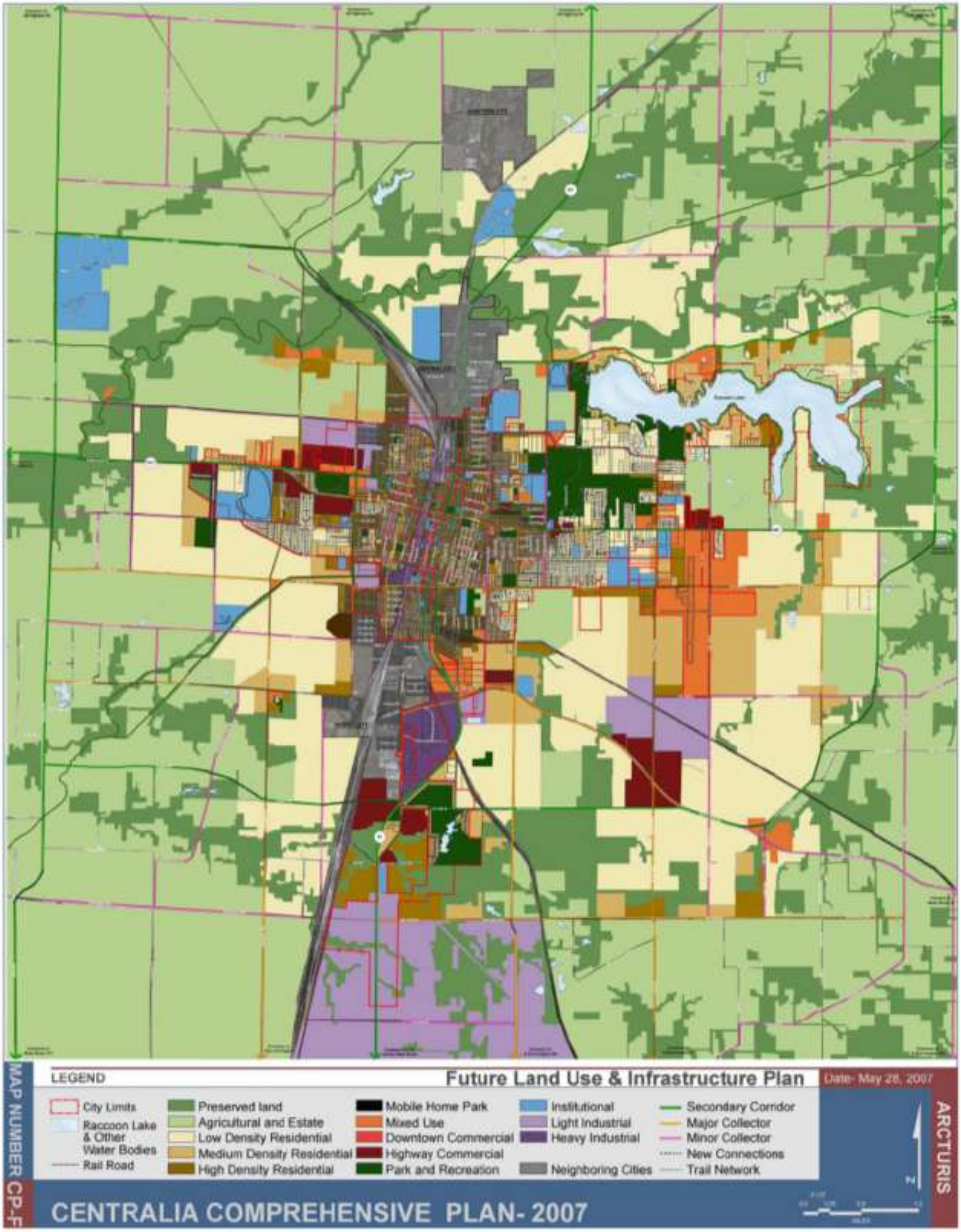


Figure 3-7: City of Centralia Future Land Use and Infrastructure Plan



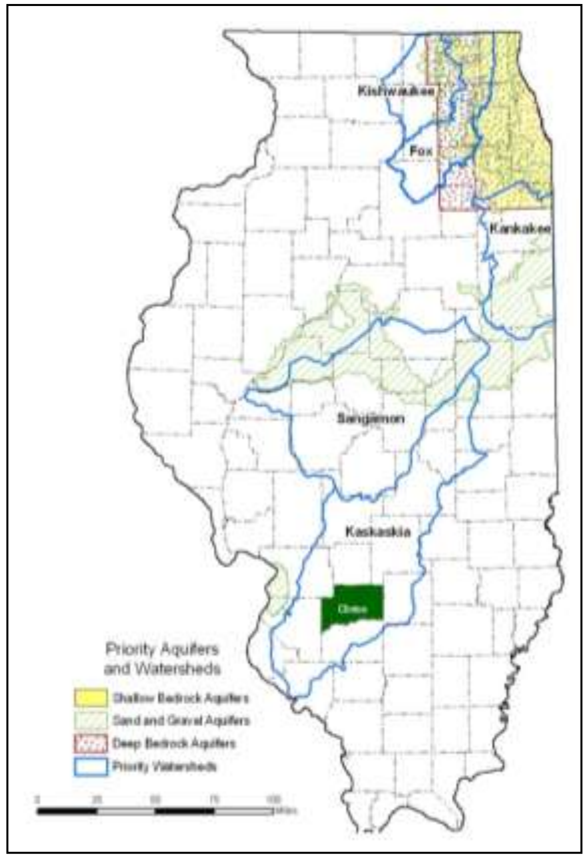
3.7 Major Lakes, Rivers and Watersheds

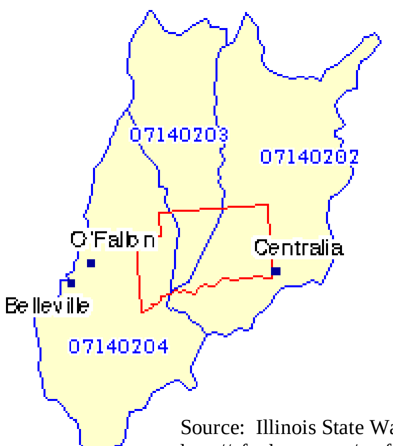
Table 3-4: Watersheds by HUC Identifier

Watershed Name	Hydrologic Unit Code
Middle Kaskaskia, Illinois	07140202
Shoal, Illinois	07140203
Lower Kaskaskia, Illinois	01740204

Source: U.S. Geological Survey HUC14 Watersheds, 2006

Clinton County Lies at the heart of one of Illinois' Priority Watersheds. The Kaskaskia River is the most managed river in Illinois for water supply use according to the Illinois State Water Survey of the Department of Natural Resources in its "Prioritizing Illinois Aquifers and Watersheds for Water Supply Planning", July, 2006. The U.S. Corps of Engineers Carlyle Lake Dam on the Kaskaskia at the City of Carlyle 107 miles above its confluence with the Mississippi creates a 26,000-acre reservoir 15 miles long by 3.5 miles wide, the largest man-made lake in Illinois.





Source: Illinois State Water Survey, US Environmental Protection Agency, http://cfpub.epa.gov/surf/county.cfm?fips_code=17027, accessed 5/1/09

Table 3-5 Watersheds in Southwestern Illinois

Watersheds	Rivers, Streams, Creeks (Miles)	Lakes, Ponds, Reservoir (Acres)	Bays, Estuaries (Square Miles)	Coastal Shorelines (Miles)	Wetlands (Acres)	Inland Lake Shoreline (Miles)	Great Lakes Connecting Channel (Miles)
UPPER KASKASKIA	364.59	11,219.50	0	0	0	0	0
MIDDLE KASKASKIA	445.6	26,925.80	0	0	0	0	0
SHOAL	216.16	4,529.40	0	0	0	0	0
CAHOKIA-JOACHIM	268.48	3,085.10	0	0	0	0	0
LOWER KASKASKIA	482.6	613.6	0	0	0	0	0

Source: US Environmental Protection Agency, *National Assessment Database 2006*

Section 4 - Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation must be based on sound risk assessment. Risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people. This assessment identifies the characteristics and potential consequences of a disaster, how much of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of three components: hazard identification, vulnerability analysis, and risk analysis.

4.1 Hazard Identification/Profile

4.1.1 Existing Plans

The previous Clinton County Comprehensive Emergency Management Plan (CEMP) did not contain a risk analysis. Additional local planning documents were reviewed to identify historical hazards and help identify risk. To facilitate the planning process, FIRM maps were used for the flood analysis.

4.1.2 Planning Team

During Meeting #2, which occurred on May 2, 2009, the planning team developed and ranked a list of hazards that affect the county. The team identified 1) severe thunderstorms with tornadoes, 2) winter storms, 3) earthquakes, and 4) flooding which occurs on an annual basis during the spring. The plan also identified Clinton County's principal technological hazards (in order of likelihood): 1) land transportation accidents with hazardous material release, 2) mine subsidence, and 3) fire\explosion.

4.1.3 National Hazard Records

In addition to these identified hazards, the MHMP planning committee reviewed the list of natural hazards prepared by FEMA. To assist the planning team, historical storm event data was compiled from the National Climatic Data Center (NCDC; http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll). This NCDC data included 280 reported events in Clinton County between February 25, 1956 and April 2, 2008. A summary table of events related to each hazard type is included in the hazard profile sections that follow. List of the events, including additional sources that identify specific occurrences, are included as Appendix D. In addition to NCDC data, Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail were plotted using SPC recorded latitude and longitude. These events are plotted and included as Appendix E. The list of NCDC hazards is included in Table 4-1.

Table 4-1: Climatic Data Center Historical Hazards

Hazard
Tornadoes
Severe Thunderstorms
Drought/Extreme Heat
Winter Storms
Flood/Flash flood

4.1.4 Hazard Ranking Methodology

Based on planning team input, national datasets, and existing plans, Table 4-2 lists the hazards Clinton County will address in this multi-hazard mitigation plan. In addition, these hazards ranked the highest based on the Risk Priority Index discussed in section 4.1.5.

Table 4-2: Planning Team Hazard List

Hazard
Tornado
Severe Thunderstorms
Winter Storms
Hazardous Material Transportation
Earthquakes
Mine Subsidence
Flooding

4.1.5 Calculating the Risk Priority Index

The first step in determining the Risk Priority Index (RPI) was to have the planning team members generate a list of hazards which have befallen or could potentially befall their community. Next, the planning team members were asked to assign a likelihood rating based on the criteria and methods described in the following table. Table 4-3 displays the probability of the future occurrence ranking. This ranking was based upon previous history and the definition of hazard. Using the definitions given, the likelihood of future events is "Quantified" which results in the classification within one of the four "Ranges" of likelihood.

Table 4-3: Future Occurrence Ranking

Probability	Characteristics
4 - *Highly Likely*	Event is probable within the calendar year. Event has up to 1 in 1 year chance of occurring. (1/1=100%) History of events is greater than 33% likely per year.
3 - *Likely*	Event is probable within the next three years. Event has up to 1 in 3 years chance of occurring. (1/3=33%) History of events is greater than 20% but less than or equal to 33% likely per year.
2 - *Possible*	Event is probable within the next five years. Event has up to 1 in 5 years chance of occurring. (1/5=20%) History of events is greater than 10% but less than or equal to 20% likely per year.
1 - *Unlikely*	Event is possible within the next ten years. Event has up to 1 in 10 years chance of occurring. (1/10=10%) History of events is less than or equal to 10% likely per year.

Next, planning team members were asked to consider the potential magnitude/severity of the hazard according to the severity associated with past events of the hazard. Table 4-4 gives four classifications of magnitude/severity.

Table 4-4: Hazard Magnitude

Magnitude/Severity	Characteristics
8 - *Catastrophic*	Multiple deaths. Complete shutdown of facilities for 30 or more days. More than 50% of property is severely damaged.
4 - *Critical*	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least 14 days. More than 25% of property is severely damaged.
2 - *Limited*	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than seven days. More than 10% of property is severely damaged.
1 - *Negligible*	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10% of property is severely damaged.

Finally, the RPI was calculated by multiplying the probability by the magnitude/severity of the hazard. Using these values, the planning team member where then asked to rank the hazards. Table 4-5 identifies the RPI and ranking for each hazard facing Clinton County.

Table 4-5: Clinton County Hazards (RPI)

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Tornado	4 - Highly Likely	2 - Limited	8	1
Severe Thunderstorms	4 - Likely	2 - Limited	8	2
Winter Storms	2 - Possible	4 - Critical	8	3
Hazardous Material Transportation	2 - Possible	2 - Limited	4	4
Earthquakes	2 - Possible	4 - Critical	8	5
Mine Subsidence	3 - Likely	1 - Negligible	3	6
Flooding	2 - Possible	1 - Negligible	6	7

4.1.6 Jurisdictional Hazard Ranking

Because the jurisdictions in Clinton County differ in their susceptibilities to certain hazards—for example, village of Albers located along Lake and Grassy branch is more likely to experience significant flooding than Trenton which is located a substantial distance away from any substantial stream or river which could potentially cause significant flooding—the hazards identified by the planning team were ranked by planning team members for their respective jurisdictions using the methodology outlined in Section 4.1.5. Some communities were not represented at the hazard ranking meeting (meeting 2). For these communities the hazards identified by the planning team were ranked by SIUC. The SIUC rankings were based on input from the other planning team members, available historical data, and the hazard modeling results described within this plan. During the five-year review of the plan, this table will be updated by representatives from the planning team to ensure these jurisdictional rankings accurately reflect each community's assessment of these hazards. Table 4-6 lists the jurisdictions and their respective hazard rankings (Ranking 1 being the highest concern).

Table 4-6: Hazard Rankings by Jurisdiction

Jurisdiction	Hazard						
	Tornado	HAZMAT	Earthquake	Thunderstorms	Flooding	Winter Storms	Subsidence
Albers	1	4	5	2	7	3	6
Aviston*	1	4	5	2	6	3	NA
Beckemeyer	2	4	5	3	7	1	6
Bartelso	2	3	5	1	4	7	NA
Breese*	1	4	5	2	6	3	7
Carlyle	1	4	5	2	6	3	NA
Centralia*	1	3	5	2	6	4	7
Damiansville	1	4	5	2	7	3	NA
Hoffman	2	7	4	1	6	5	3
Huey*	1	4	5	2	6	3	NA
Germantown	4	5	7	2	1	3	6
Keyesport*	1	5	4	2	6	3	NA
New Baden*	1	4	5	2	7	3	6
Trenton	2	5	4	1	7	3	6

* Ranked by SIUC
NA = Not applicable

4.1.7 GIS and HAZUS-MH

The third step in this assessment is the risk analysis, which quantifies the risk to the population, infrastructure, and economy of the community. Where possible, the hazards were quantified using GIS analyses and HAZUS-MH. This process reflects a level two approach to analyzing hazards as defined for HAZUS-MH. The approach includes substitution of selected default data with local data. Level two analysis significantly improves the accuracy of the model predictions.

HAZUS-MH generates a combination of site-specific and aggregated loss estimates depending upon the analysis options that are selected and upon the input that is provided by the user. Aggregate inventory loss estimates, which include building stock analysis, are based upon the assumption that building stock is evenly distributed across census blocks/tracts. Therefore, it is possible that overestimates of damage will occur in some areas while underestimates will occur in other areas. With this in mind, total losses tend to be more reliable over larger geographic areas than for individual census blocks/tracts. It is important to note that HAZUS-MH is not intended to be a substitute for detailed engineering studies. Rather, it is intended to serve as a planning aid for communities interested in assessing their risk to flood-, earthquake-, and hurricane-related hazards. This documentation does not provide full details on the processes and procedures completed in the development of this project. It is only intended to highlight the major steps that were followed during the project.

Site-specific analysis is based upon loss estimations for individual structures. For flooding, analysis of site-specific structures takes into account the depth of water in relation to the structure. HAZUS-MH also takes into account the actual dollar exposure to the structure for the costs of building reconstruction, content, and inventory. However, damages are based upon the assumption that each structure falls into a structural class, and that structures in each class will respond in similar fashion to a specific depth of flooding. Site-specific analysis is also based upon a point location rather than a polygon; therefore the model does not account for the percentage of a building that is inundated. These assumptions suggest that the loss estimates for site-specific structures as well as for aggregate structural losses need to be viewed as approximations of losses that are subject to considerable variability rather than as exact engineering estimates of losses to individual structures.

The following events were analyzed. The parameters for these scenarios were created using GIS, HAZUS-MH, and historical information to predict which communities would be at risk.

Using HAZUS-MH

1. 100-year overbank flooding
2. Earthquake

Using GIS

1. Tornado
2. Hazardous Material Release

4.2 Vulnerability Assessment

4.2.1 Asset Inventory

4.2.1.1 Processes and Sources for Identifying Assets

The HAZUS-MH data is based on best available national data sources. The initial step involved updating the default HAZUS-MH data using State of Illinois data sources. At Meeting #1, the planning team members were provided with a plot and report of all HAZUS-MH critical facilities. The planning team took GIS data provided by SIU-Polis, verified the datasets using local knowledge, and allowed SIU-Polis to use their local GIS data for additional verification. SIU-Polis GIS analysts made these updates and corrections to the HAZUS-MH data tables prior to performing the risk assessment. These changes to the HAZUS-MH inventory allow a level two analysis. This update process improved the accuracy of the model predictions.

The default HAZUS-MH data has been updated as follows:

- The HAZUS-MH defaults, critical facilities, and essential facilities have been updated based on most recent available data sources. Critical and essential point facilities have been reviewed, revised, and approved by local subject matter experts at each county.
- The essential facility updates (schools, medical care facilities, fire stations, police stations, and EOCs) have been applied to the HAZUS-MH model data. HAZUS-MH reports of essential facility losses reflect updated data.
- Parcels with assessment improvements (buildings) values were used to estimate the number of buildings in the flood-prone areas.
- The analysis is restricted to the county boundaries. Events that occur near the county boundary do not contain damage assessments from the adjacent county.

4.2.1.2 Essential Facilities List

Table 4-7 identifies the critical facilities that were added or updated for the analysis. A complete list of the critical facilities is included as Appendix F. A map of all the critical facilities is included as Appendix G.

Table 4-7: Critical Facilities List

Facility	Number of Facilities
Care Facilities	13
Emergency Operation Centers	1
Fire Stations	14
Police Stations	9
Schools	26

4.2.1.3 Facility Replacement Costs

Default HAZUS-MH building stock data were used for the HAZUS-MH analyses. Facility replacement costs and total building exposure are identified in Table 4-8. Table 4-8 also includes the estimated numbers of buildings within each occupancy class.

Table 4-8: Building Exposure (default HAZUS-MH) for Clinton County

General Occupancy	Estimated Total Buildings	Total Building Exposure (X 1000)
Agricultural	20	$ 90,564
Commercial	218	$ 783,641
Education	10	$ 156,014
Government	16	$ 44,835
Industrial	56	$ 277,854
Religious/Non-Profit	45	$ 82,528
Residential	12,808	$ 2,723,460
Total	**13,173**	**$ 4,158,896**

Clinton County provided parcel boundaries with assessed values. The parcel data were used to estimate the actual number of buildings within the flood-prone areas. The parcel data identified parcels with building improvements, which were then converted into centroid point locations. The parcels with improvements are summarized by occupancy class in Table 4-9.

Table 4-9: Parcels with Improvements by Occupancy Class for Clinton County

Occupancy Class	Number of Structures
Residential	12,237
Commercial	61
Industrial	1
Exempt	55
Total	**12,354**

4.3 Future Development

Clinton County is subject to a variety of natural disasters. County government, in partnership with State government, must make a commitment to prepare for those types of disasters. Likewise, the Clinton County manufacturing base leaves the county vulnerable to major hazardous materials events and other technological threats. However, as the county-elected and appointed officials become better informed on the subject of community hazards, they will be better able to set and direct policies that will enable emergency management and county response agencies to effectively plan, train, and exercise. The end result will be a stronger community and a better place in which to work, live, and grow.

4.4 Hazard Profiles

4.4.1 Tornado Hazard

Hazard Definition for Tornado Hazard

Tornadoes pose a great risk to the State of Illinois and its citizens. Tornadoes historically have occurred during any month of the year. The unpredictability of tornadoes makes them one of Illinois' most dangerous hazards. Their extreme winds are violently destructive when they touch down in the region's developed and populated areas. Current estimates place the maximum velocity at about 300 mph, but higher and lower values can occur. A wind velocity of 200 mph will result in a wind pressure of 102.4 pounds per square foot of surface area, a load that exceeds the tolerance limits of most buildings. Considering these factors, it is easy to understand why tornadoes can be so devastating for the communities they hit.

Tornadoes are defined as violently-rotating columns of air extending from thunderstorms to the ground. Funnel clouds are rotating columns of air not in contact with the ground. However, the violently-rotating column of air can reach the ground very quickly and become a tornado. If the funnel cloud picks up and blows around debris, it has reached the ground and is a tornado.

Tornadoes are classified according to the Fujita tornado intensity scale. The tornado scale ranges from low intensity F0, with effective wind speeds of 40 to 70 mph, to F5 tornadoes with effective wind speeds of over 260 mph. The Fujita intensity scale is included in Table 4-10.

Table 4-10: Fujita Tornado Rating

Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
0 (Gale)	40–72 mph	6–17 yards	0.3–0.9 miles	Light damage, some damage to chimneys, branches broken, sign boards damaged, shallow-rooted trees blown over.
1 (Moderate)	73–112 mph	18–55 yards	1.0–3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
2 (Significant)	113–157 mph	56–175 yards	3.2–9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
3 (Severe)	158–206 mph	176–566 yards	10–31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
4 (Devastating)	207–260 mph	0.3–0.9 miles	32–99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
5 (Incredible)	261–318 mph	1.0–3.1 miles	100–315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Previous Occurrences for Tornado Hazard

There have been several occurrences of tornadoes within Clinton County during recent decades. The NCDC database reported 17 tornadoes/funnel clouds in Clinton County since 1956. These tornados have been attributed with two deaths and $6.1 million dollars in property damage within Clinton and adjacent counties. As of April 2008, the most recent tornado touchdown occurred on July 21, 2007. This tornado formed west of Germantown and destroyed a large poultry building and damaged two other buildings. Debris from the poultry building was thrown 1/2 mile to the east. The tornado also severed the tops of several trees in the south part of Germantown. Clinton County tornadoes recorded in the NCDC database are identified in Table 4-11. Additional details for NCDC events are included in Appendix D

Table 4-11: Clinton County Tornadoes*

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Clinton	2/25/1956	Tornado	F4	0	0	2.5M
Clinton	4/5/1958	Tornado	F3	0	0	250K
Clinton	3/8/1964	Tornado	F2	0	0	25K
Clinton	12/21/1967	Tornado	F2	0	0	2.5M
Clinton	4/3/1968	Tornado	F1	0	0	250K
Clinton	4/18/1975	Tornado	F1	0	0	250K
Clinton	10/22/1979	Tornado	F1	0	0	25K
Clinton	12/2/1982	Tornado	F3	2	0	25.0M
Clinton	11/26/1990	Tornado	F0	0	0	25K

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Carlyle	6/16/2000	Tornado	F0	0	0	0
Bartelso	4/4/2003	Tornado	F1	0	0	0
Germantown	6/10/2003	Tornado	F0	0	0	0
St Rose	5/19/2004	Tornado	F0	0	0	0
Breese	5/30/2004	Tornado	F1	0	0	0
Albers	7/4/2005	Tornado	F0	0	0	0
Trenton	7/21/2006	Tornado	F0	0	0	0
Germantown	7/21/2006	Tornado	F1	0	0	0

Source: NCDC

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Tornado Hazard

The entire county has the same risk for occurrence of tornadoes. They can occur at any location within the county.

Hazard Extent for Tornado Hazard

The historical tornadoes listed previously generally move from west to east across the county—although many other tracks are possible—from more southerly to northerly. The extent of the hazard varies both in terms of the extent of the path and the wind speed.

Calculated Risk Priority Index for Tornado Hazard

Based on historical information, the probability of future tornadoes in Clinton County is likely. Tornadoes with varying magnitudes are expected to happen. According to the Clinton County planning team's assessment the risk priority index (RPI) assessment, tornadoes ranked as the number one hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
4	x	2	=	8

Vulnerability Analysis for Tornado Hazard

Tornadoes can occur within any area of the county; therefore, the entire county population and all buildings are vulnerable to tornadoes. To accommodate this risk, this plan will consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Clinton County are discussed in types and numbers in Table 4-9.

Critical Facilities

All critical facilities are vulnerable to tornadoes. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts will vary based on the magnitude of the tornado, but can include structural failure, debris (trees or limbs) causing damage, roofs blown off or windows broken by hail or high winds, and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). Table 4-7 lists the types and numbers of all of the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure for the entire county is listed in Table 4-8. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, debris (trees or limbs) causing damage, roofs blown off or windows broken by hail or high winds, and loss of building function (e.g. a damaged home will no longer be habitable causing residents to seek shelter).

Infrastructure

During a tornado the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these items could become damaged during a tornado. The impacts to these items include broken, failed or impassable roadways, broken or failed utility lines (e.g. loss of power or gas to community), and railway failure from broken or impassable railways. Bridges could fail or become impassable causing risk to traffic.

An example scenario is described as follows to illustrate the anticipated impacts of tornadoes in the county in terms of numbers and types of buildings and infrastructure.

Clinton County Tornado Analysis

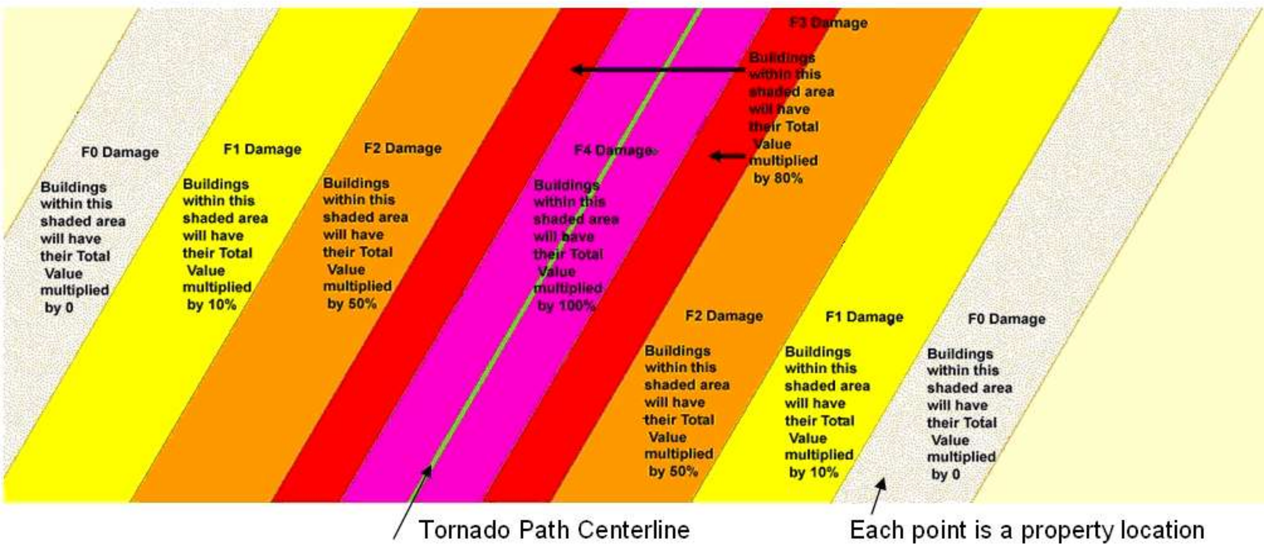
GIS overlay modeling was used to determine the potential impacts of an F4 tornado. The analysis used a hypothetical path based. The selected widths were based on a recreation of the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these six categories. The Fujita Scale guidelines are described in Table 4-12.

Table 4-12: Tornado Path Widths and Damage Curves

Fujita Scale	Path Width (feet)	Maximum Expected Damage
F-5	3000	100%
F-4	2400	100%
F-3	1800	80%
F-2	1200	50%
F-1	600	10%
F-0	300	0%

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path with a decreasing amount of damage away from the center of the damage path. This natural process was modeled in GIS by adding damage zones around the tornado path. Figures 4-1 and Table 4-13 describe the zone analysis.

Figure 4-1: GIS Analysis Using Tornado Buffers



Once the hypothetical route is digitized on the map, several buffers are created to model the damage functions within each zone.

An F4 tornado has four damage zones. Total devastation is estimated within 150 feet of the tornado path (the darker colored zone 1). The outer buffer is 900 feet from the tornado path (the lightest colored zone 4), within which 10% of the buildings will be damaged.

Table 4-13: Tornado Zones and Damage Curves

Fujita Scale	Zone	Buffer (feet)	Damage Curve
F-4	4	600-900	10%
F-4	3	300-600	50%
F-4	2	150-300	80%
F-4	1	0-150	100%

The selected hypothetical tornado path is depicted in Figure 4-2, and the damage curve buffers with damaged buildings are shown in Figure 4-3.

Figure 4-2: Hypothetical F-4 Tornado Path in Clinton County

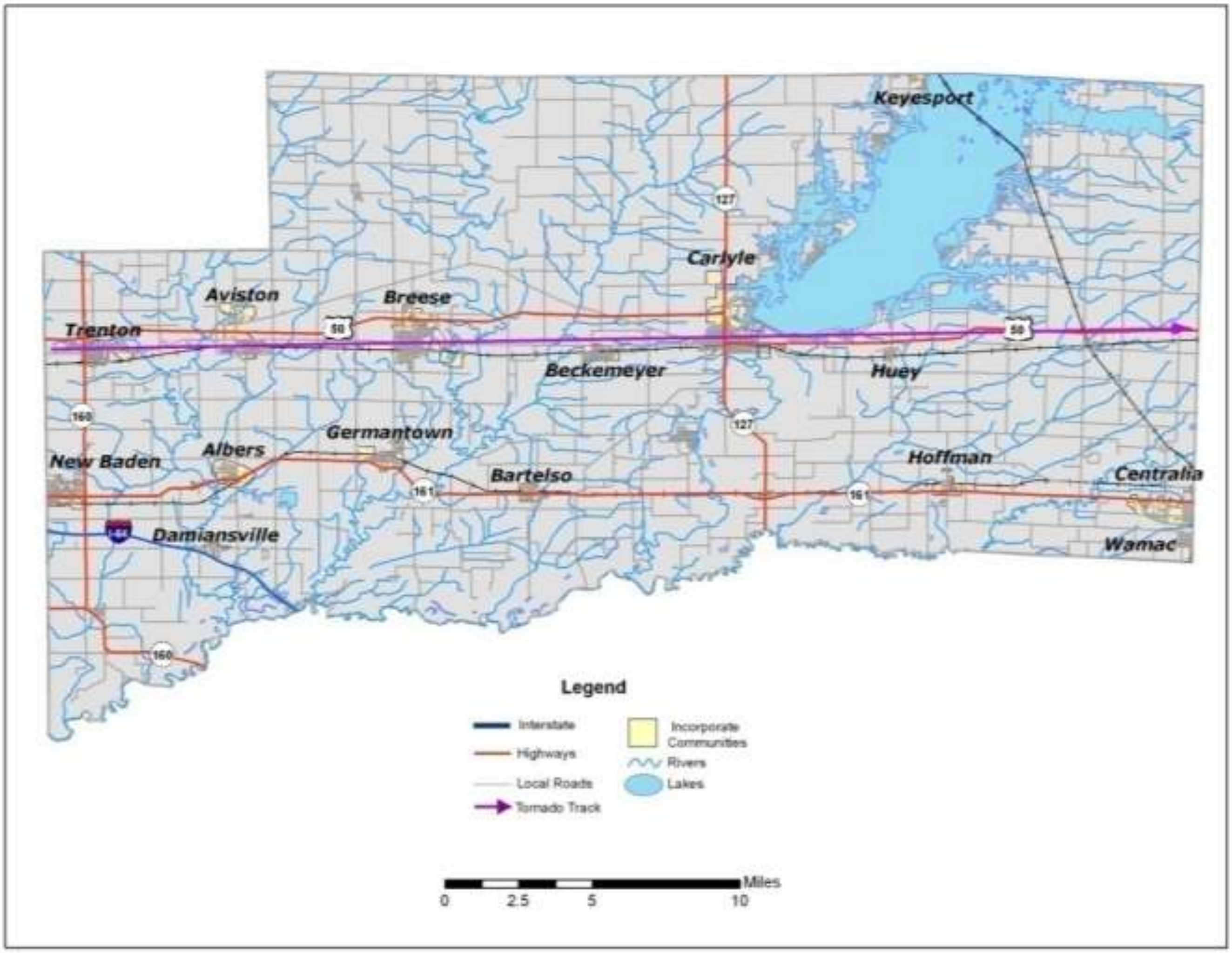
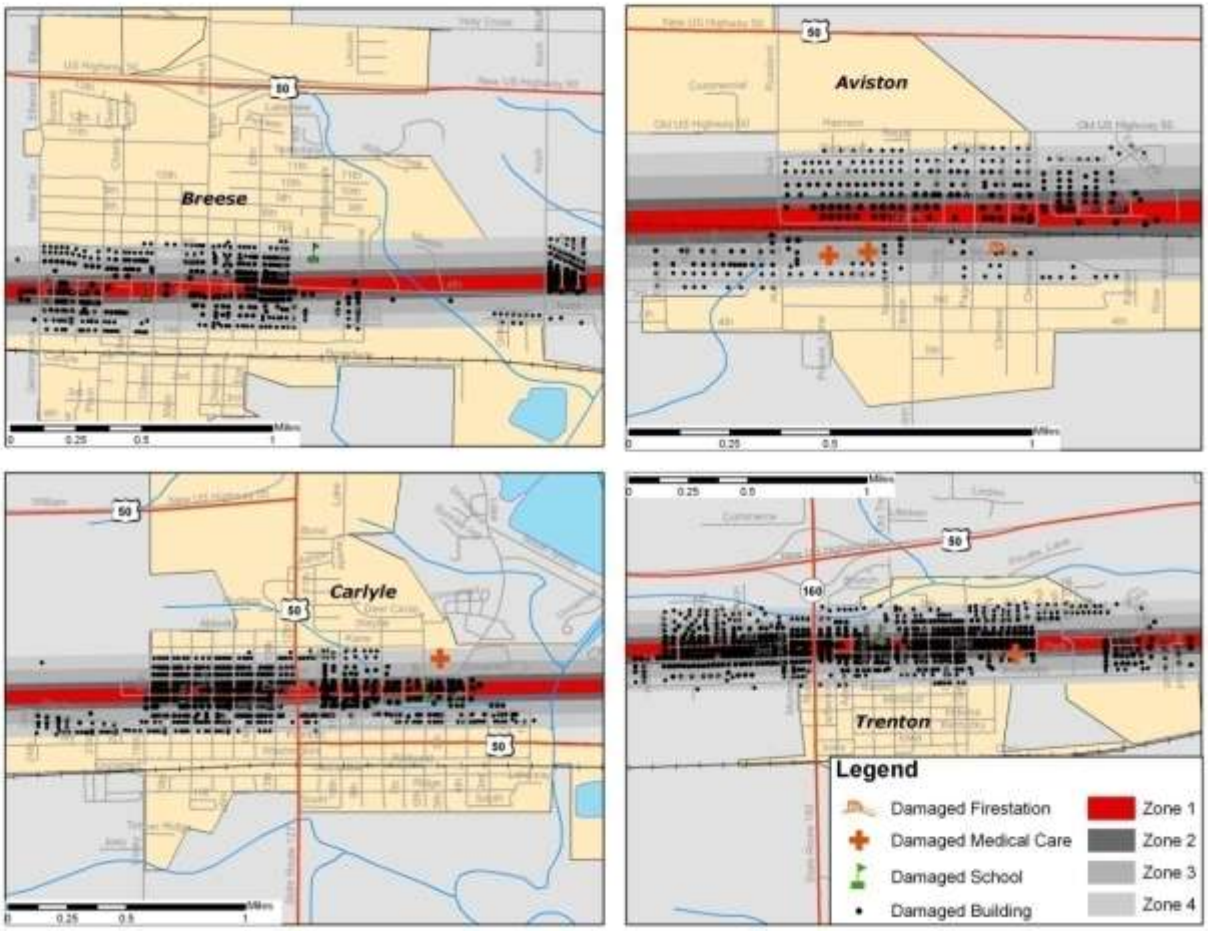


Figure 4-3: Modeled F-4 Tornado Damage Buffers in Aviston, Breese, Carlyle, and Trenton



The results of the analysis are depicted in Tables 4-14 and 4-15. The GIS analysis estimates that 1,907 buildings will be damaged. The estimated building losses were approximately $156 million. The building losses are an estimate of assessed values multiplied by the percentages of damage. The overlay was performed against parcels provided by Clinton County that were joined with Assessor records showing property improvement.

The Assessor records often do not distinguish parcels by occupancy class if the parcels are not taxable. For purposes of analysis, the total number of buildings and the assessed values for government, religious/non-profit, and education should be lumped together as exempt.

Table 4-14: Estimated Numbers of Buildings Damaged by Occupancy Type

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	338	324	630	591
Commercial	0	1	6	3
Industrial	0	0	0	0
Agriculture	0	0	0	3
Exempt	2	1	5	3
Total	**340**	**326**	**641**	**600**

Table 4-15: Estimated Building Losses x $1,000 by Occupancy Type

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$ 48,747	$ 39,489	$ 46,801	$ 9,827
Commercial	0	$ 217	$ 923	$ 57
Industrial	0	0	0	0
Agriculture	0	0	0	0
Exempt	$ 1,000	$440	$275	$100
Total	$**49,847**	**$48,164**	**$47,999**	**$9,984**

Essential Facilities Damage

There are 11 essential facilities located within 900 feet of the hypothetical tornado path. The model predicts, two fire departments, five schools, and four care facilities would and one hospital would experience damage. The affected facilities are identified in Table 4-16, and their geographic locations are shown in Figures 4-3.

Table 4-16: Estimated Essential Facilities Affected

Name
Aviston Countryside Manor
Aviston Terrace
Carlyle Healthare Center
Oakview Home
Aviston Fire Protection District
Sugar Creek Township Fire District
All Saints Academy
Breese Elementary School
Carlyle Elementary School
Central Community High School
Trenton Elementary School

Vulnerability to Future Assets/Infrastructure for Tornado Hazard

The entire population and buildings have been identified as at risk because tornadoes can occur anywhere within the State of Illinois, at any time of the day, and during any month of the year. Furthermore, any future development in terms of new construction within the county will be at risk. The building exposure for Clinton County is included in Table 4-8.

All critical facilities in the county and its communities are at risk. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Analysis of Community Development Trends

Preparing for severe storms will be enhanced if officials sponsor a wide range of programs and initiatives to address the overall safety of county residents. New structures should be built with sturdier construction, and existing structures should be hardened to lessen the potential impacts of severe weather. Community sirens to warn of approaching storms are also vital to ensuring the safety of Clinton County residents.

4.4.2 Flood Hazard

Hazard Definition for Flooding

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates into the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Floods can be classified as one of two types: upstream floods or downstream floods. Both types of floods are common in Illinois. Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another eighteen inches might carry off a car. Generally, upstream floods cause damage over relatively localized areas, but they can be quite severe in the local areas where they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at anytime of the year in Illinois, but they are most common in the spring and summer months.

Downstream floods, sometimes called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and time of the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage. Riverine flooding on the large rivers of Illinois generally occurs during either the spring or summer.

Previous Occurrences for Riverine and Flash Flooding

The NCDC database reported 15 flood events in Clinton County since 1993. These flood events have been attributed with over half a million dollars in property damage. A recent example of flooding in Clinton County occurred during the last week in April 2002 when heavy rain caused the Kaskaskia River out of its banks. The flooding was relatively minor, but continued and worsened in May.

Significant Clinton County floods recorded by the NCDC are shown in Table 4-17. A complete list of flood events and additional information about the significant flood events are included in Appendix D. Historical flood crests and discharges at hydrologic monitoring stations are summarized in Appendix H.

Table 4-17: Clinton County Previous Occurrences of Flooding*

Location	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Huey	11/14/1993	Flash Flood	N/A	0	0	$50K
Germantown	4/11/1994	Flash Flood	N/A	0	0	$5K
Clinton	5/16/1995	Flash Flood	N/A	0	0	$1K
Clinton	5/17/1995	Flash Flood	N/A	0	0	0
Clinton	4/28/1996	Flash Flood	N/A	0	0	0
Clinton	6/10/1996	Flash Flood	N/A	0	0	$500K
Clinton	6/24/2000	Flash Flood	N/A	0	0	0
Clinton	5/12/2002	Flash Flood	N/A	0	0	0
Carlyle	11/10/2002	Flash Flood	N/A	0	0	0
East Central Portion	6/11/2003	Flash Flood	N/A	0	0	0
Clinton	8/29/2003	Flash Flood	N/A	0	0	0
Clinton	5/27/2004	Flash Flood	N/A	0	0	0
Hoffman	6/26/2007	Flash Flood	N/A	0	0	0
Clinton	4/28/2002	Flood	N/A	0	0	0
Clinton	5/1/2002	Flood	N/A	0	0	0

Source: NCDC

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Repetitive Loss Properties

FEMA defines a repetitive loss structure as a structure covered by a contract of flood insurance issued under the National Flood Insurance Program (NFIP), which has suffered flood loss damage on two or more occasions during a 10-year period that ends on the date of the second loss, in which the cost to repair the flood damage is 25% of the market value of the structure at the time of each flood loss.

Illinois Emergency Management was contacted to determine the location of repetitive loss structures in Clinton County. Records show that there are no repetitive loss structures within the county.

Geographic Location for Flooding

Most riverine floods in Illinois occur during either the spring or summer and are the result of excessive rainfall and/or the combination of rainfall and snowmelt. Flash flooding in Illinois can occur during anytime of the year, but tends to be less frequent and more localized between mid-summer and early winter.

The primary sources of river flooding in Clinton County are the Kaskaskia River and it major tributaries: Beaver Creek, Crooked Creek, Grassy Branch, Lake Branch and Shoal Creek. The Kaskaskia River can flood portions of the City of Carlyle and a significant area along the south boundary of the County. Lake and Grass Branch can inundate portions of Albers. Shoal creek can flood parts of Breese and Germantown. Flooding along these rivers and streams can impact major transportation routes such as US 50, State Routes 160 and 161.

Flash flooding in Clinton County typically occurs or is best documented in urban/developed areas. For example on June 26, 2007 flash flooding caused local law enforcement to close State Route 161 which was flooded in several locations between Posey to Centralia. Heavy rainfall from the morning combined with thunderstorms during the afternoon to produce 2 - 4 inches of rain across eastern Clinton County.

The new Clinton County DFIRM was used to identify specific stream reaches for analysis. The areas of riverine flooding are depicted on the map in Appendix E.

In meeting #4 held on September 2, 2009, the planning team members listed voluntary buyouts as a mitigation strategy to alleviate flood damage in the county. They identified potential hazard areas in which buyouts may be a useful to mitigate flood damages. The jurisdiction, general location and the approximate number of structures are listed in Table 4-18.

Table 4-18: Potential Voluntary Buyout Properties

Jurisdiction	Number of Structures	Location
Albers	10	Lake Branch Floodplain
Aviston	10	Lake Branch Floodplain
Bartelso	10	Tributary to the Kaskaskia River Floodplain
Breese	10	Tributaries to Shoal Creek Floodplain
Carlyle	5	Kaskaskia River Floodplain
Damiansville	3	Sugar Creek Floodplain
Germantown	20	Beaver Creek Floodplain
Trenton	5	Tributary to Sugar Creek Floodplain
Clinton County	50	Tributaries to the Kaskaskia River, Sugar Beaver, Shoal, and Crooked Creek Floodplains

Hazard Extent for Flooding

The HAZUS-MH flood model is designed to use a flood depth grid and flood boundary polygon from the DFIRM data. HAZUS-MH was used to model the Base Flood Elevation (BFE). The BFE is defined as the area that has a 1% chance of flooding in any given year. Planning team input and a review of historical information provided additional information on specific flood events.

Calculated Risk Priority Index for Flooding

Based on historical information and the HAZUS-MH flooding analysis results, the probability of flooding in Clinton County is possible. According to the Clinton County planning team's RPI assessment, flooding ranked as the number seven hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	1	=	2

HAZUS-MH Analysis Using 100-Year Flood Boundary and County Parcels

HAZUS-MH generated the flood depth grid for a 100-year return period and made calculations by clipping the USGS 1/3- Arc- Second DEM (~10 m) to the flood boundary. Next, HAZUS-MH utilized a user-defined analysis of Clinton County with site-specific parcel data provided by the county.

HAZUS-MH estimates that the 100-year flood for the scenario would result in 608 buildings damaged and $49.5 million in total building losses. The total estimated numbers of damaged buildings and building losses are given by occupancy class in Table 4-19. Figure 4-4 depicts the Clinton County parcel points that fall within the 100-year floodplain. Figures 4-5 and 4-6 highlight damaged buildings within the floodplain near.

Table 4-19: Clinton County HAZUS_MH Analysis Total Loss (100-Year Flood)

General Occupancy	Number of Buildings Damaged	Total Building Losses
Residential	606	$ 48,623
Commercial	1	$ 250
Industrial	0	0
Agricultural	0	0
Exempt	1	$ 670
Total	**608**	**$49,543**

Figure 4-4: Clinton County Buildings in Floodplain (100-Year Flood)

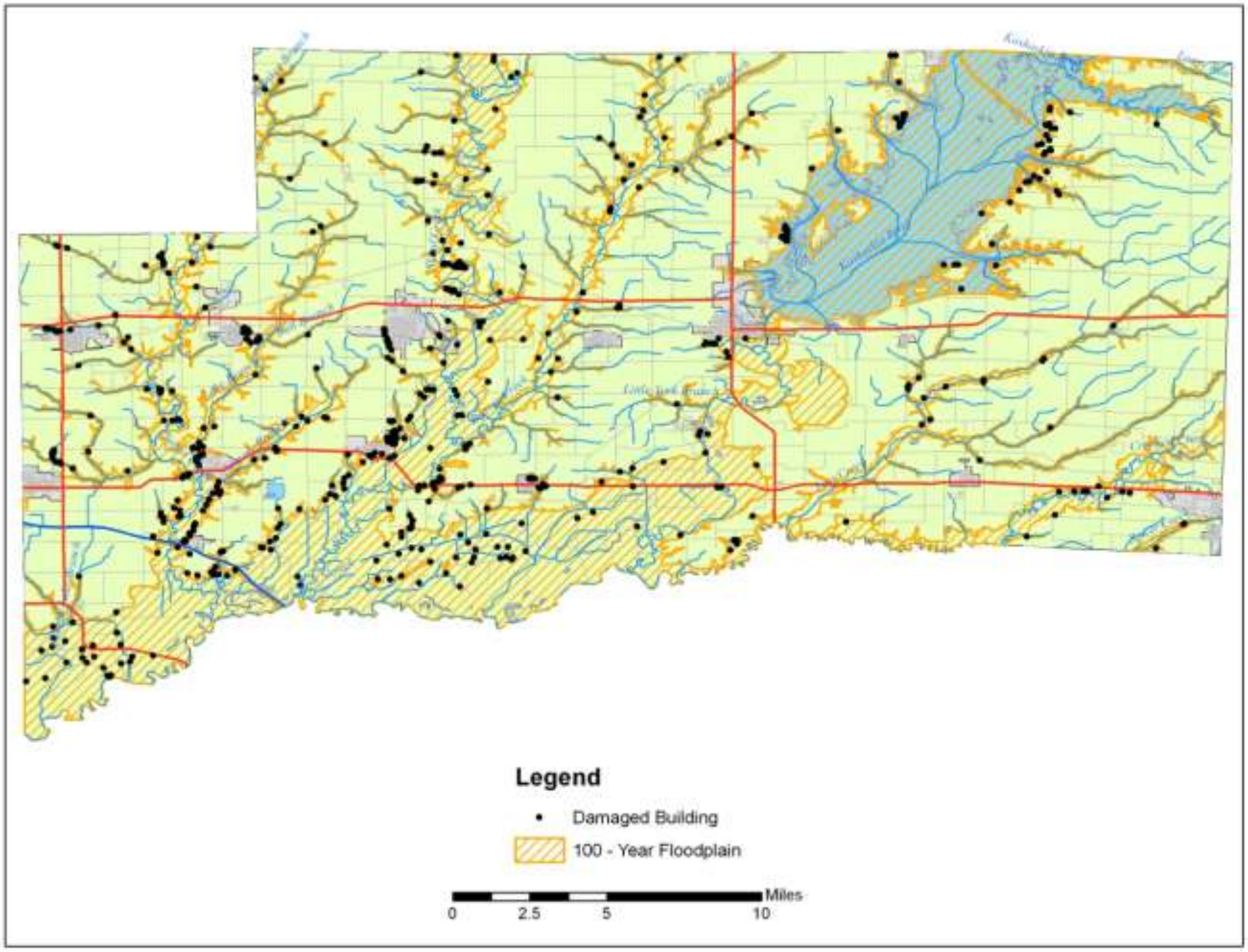


Figure 4-5: Buildings in Floodplain (100-Year Flood) near Albers, Aviston, Breese, and Damiansville

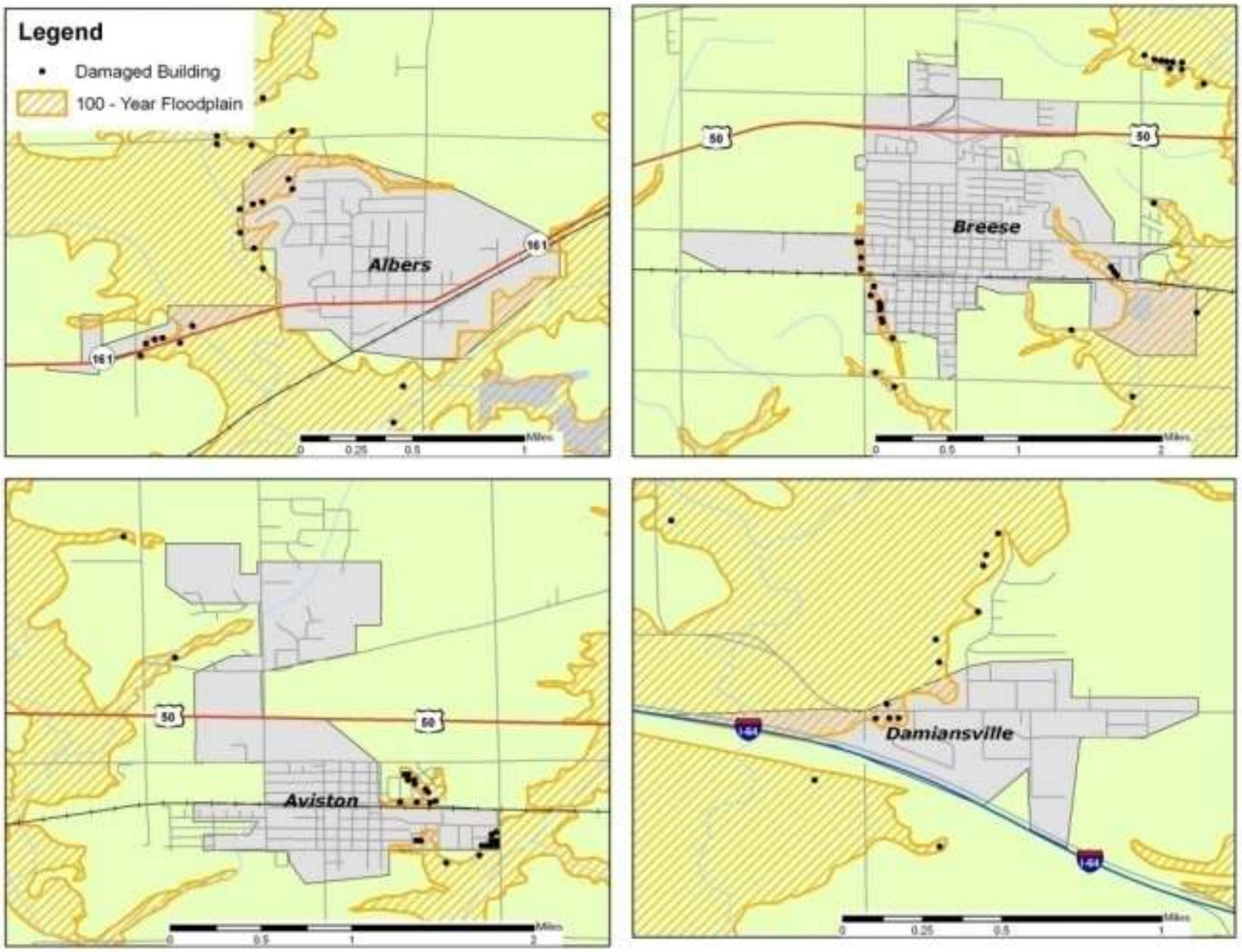
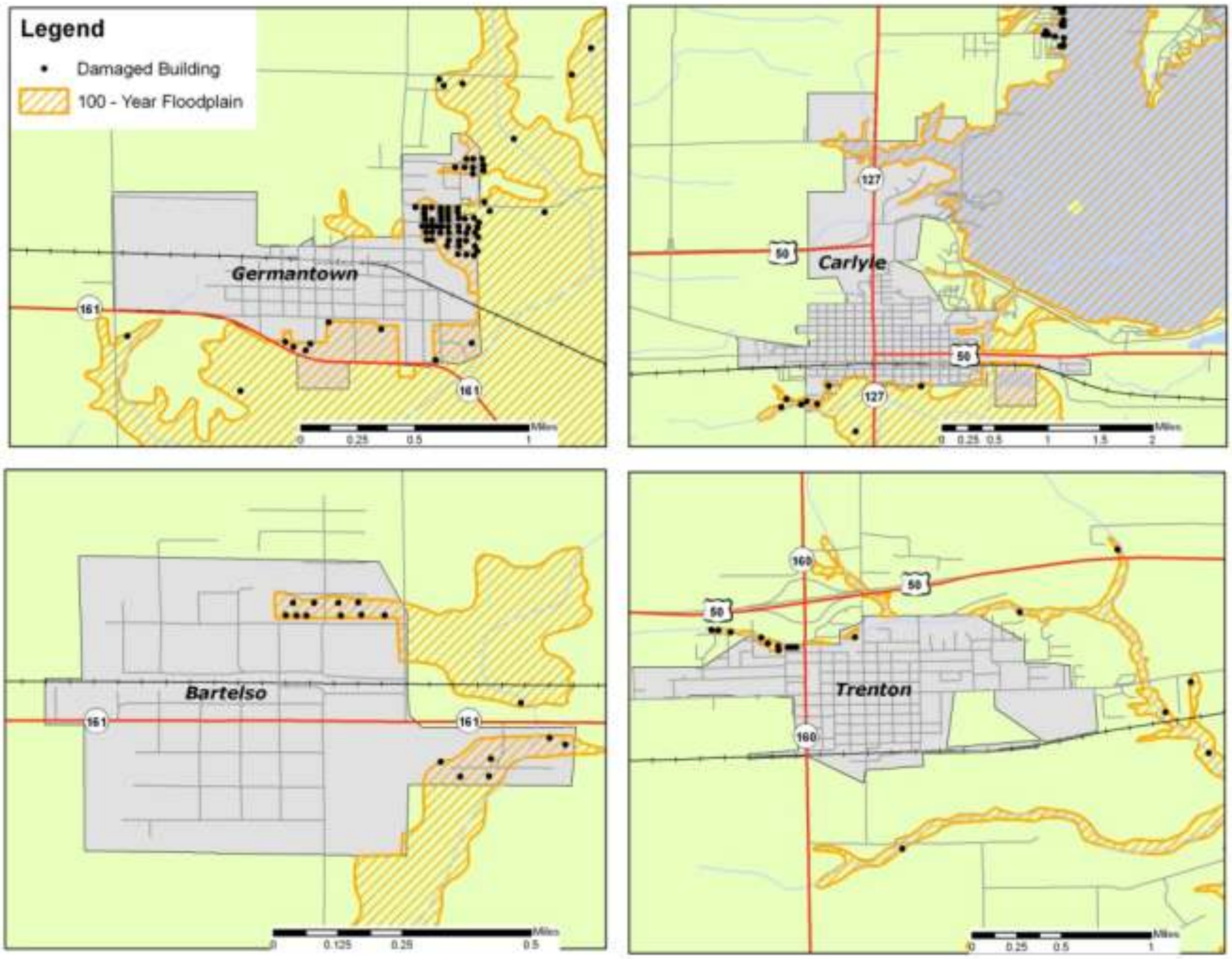


Figure 4-6: Buildings in Floodplain (100-Year Flood) near Bartelso, Carlyle, Germantown, and Trenton



Essential Facilities

An essential facility will encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community). A complete list of all the critical facilities, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

HAZUS-MH analysis revealed no essential facilities were at risk of inundation related to an upstream/riverene flood with a magnitude less than or equal to the 100-year event.

Infrastructure

The types of infrastructure that could be impacted by a flood include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available for this plan, it is important to emphasize that any number of these items could become damaged in the event of a flood. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could fail or become impassable, causing a traffic risk.

Vulnerability Analysis for Flash Flooding

Flash flooding could affect any low lying location within this jurisdiction; therefore, a significant portion of the county's population and buildings are vulnerable to a flash flood. These structures can expect the same impacts as discussed in a riverine flood.

Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Vulnerability to Future Assets/Infrastructure for Flooding

Currently, the municipality zoning boards review new development for compliance with local zoning ordinances. The Clinton County Emergency Services Disaster Agency administers the floodplain for the county. At this time no construction is planned within the area of the 100-year floodplain. Therefore, there is no new construction which will be vulnerable to a 100-year flood.

Analysis of Community Development Trends

Areas with recent development within the county may be more vulnerable to drainage issues. Storm drains and sewer systems are usually most susceptible, which can cause the back-up of water, sewage, and debris into homes and basements, causing structural and mechanical damage as well as creating public health hazards and unsanitary conditions. Controlling floodplain development is the key to reducing flood-related damages.

4.4.3 Earthquake Hazard

<u>Hazard Definition for Earthquake Hazard</u>

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, plate tectonics has shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. At their boundaries, the plates typically are locked together and unable to release the accumulating energy. When this energy grows strong enough, the plate boundary breaks free and causes the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates, as is the case for seismic zones in the Midwestern United States. The most seismically active area in the Midwest U.S. is the New Madrid Seismic Zone. Scientists have learned that the New Madrid fault system may not be the only fault system in the Central U.S. capable of producing damaging earthquakes. The Wabash Valley fault system in Illinois and Indiana manifests evidence of large earthquakes in its geologic history, and there may be other, as yet unidentified, faults that could produce strong earthquakes.

Ground shaking from strong earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated materials and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage. Magnitude measures the energy released at the source of the earthquake. Magnitude is determined from measurements on seismographs, and a single earthquake will have a single magnitude to quantify its strength. Earthquake intensity measures the strength of shaking produced by the earthquake at a certain location. Intensity is determined from effects on people, human structures, and the natural environment, and a single earthquake will have a wide range of intensity values at different locations around the epicenter. Table 4-20 is a description of earthquake intensity using an abbreviated Modified Mercalli Intensity scale, and Table 4-21 lists earthquake magnitudes and their corresponding intensities.
(Source: *http://earthquake.usgs.gov/learning/topics/mag_vs_int.php*)

Table 4-20: Abbreviated Modified Mercalli Intensity Scale

Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Table 4-21: Earthquake Magnitude vs. Modified Mercalli Intensity Scale

Earthquake Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	I
3.0 - 3.9	II - III
4.0 - 4.9	IV - V
5.0 - 5.9	VI - VII
6.0 - 6.9	VII - IX
7.0 and higher	VIII or higher

Historical Earthquakes that have Affected Clinton County

Numerous instrumentally measured earthquakes have occurred in Illinois. In the past few decades, with many precise seismographs positioned across Illinois, measured earthquakes have varied in magnitude from very low microseismic events of M=1-3 to larger events up to M=5.4. Microseismic events are usually only detectable by seismographs and rarely felt by anyone. The most recent earthquake in Illinois—as of the date of this report—occurred on August 30, 2008 at 0:46:00 local time about 2.4 km (1.5 miles) southeast of Gale, IL and measured 2.6 in magnitude.

The consensus of opinion among seismologists working in the Midwest is that a magnitude 5.0 to 5.5 event could occur virtually anywhere at any time throughout the region. Earthquakes occur in Illinois all the time, although damaging quakes are very infrequent. Illinois earthquakes causing minor damage occur on average every 20 years, although the actual timing is extremely variable. Most recently, a magnitude 5.2 earthquake shook southeastern Illinois on April 18, 2008, causing minor damage in the Mt Carmel, IL area. Earthquakes resulting in more serious damage have occurred about every 70 to 90 years.

First on the list of historical earthquakes that have affected Illinois and first on the list on continuing earthquake threats at present and into the future is seismic activity on the New Madrid Seismic Zone of southeastern Missouri. On December 16, 1811 and January 23 and February 7 of 1812, three earthquakes struck the central U.S. with magnitudes estimated to be 7.5-8.0. These earthquakes caused violent ground cracking and volcano-like eruptions of sediment *(sand blows)* over an area of >10,500 km^2, and uplift of a 50 km by 23 km zone (the Lake County uplift). The shaking rang church bells in Boston, collapsed scaffolding on the Capitol in Washington, D.C., and was felt over a total area of over 10 million km^2 (the largest felt area of any historical earthquake). Of all the historical earthquakes that have struck the U.S., an 1811-style event would do the most damage if it recurred today.

The New Madrid earthquakes are especially noteworthy because the seismic zone is in the center of the North American Plate. Such intraplate earthquakes are felt, and do damage, over much broader areas than comparable earthquakes at plate boundaries. The precise driving force responsible for activity on the New Madrid seismic zone is not known, but most scientists infer that it is compression transmitted across the North American Plate. That compression is focused on New Madrid because it is the site of a Paleozoic structure—the Reelfoot Rift—which is a zone of weakness in the crust.

The United States Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimate the probability of a repeat of the 1811–1812 type earthquakes (magnitude 7.5–8.0) is 7%–10% over the next 50 years (*USGS Fact Sheet 2006-3125*.) Frequent large earthquakes on the New Madrid seismic zone are geologically puzzling because the region shows relatively little deformation. Three explanations have been proposed: 1) recent seismological and geodetic activity is still a short-term response to the 1811–12 earthquakes; 2) activity is irregular or cyclic; or 3) activity began only in the recent geologic past. There is some dispute over how often earthquakes like the 1811–12 sequence occur. Many researchers estimate a recurrence interval of between 550 and 1100 years; other researchers suggest that either the magnitude of the 1811–12 earthquakes have been over-stated, or else the actual frequency of these events is less. It is fair to say, however, that even if the 1811–12 shocks were just magnitude ~7 events, they nonetheless caused widespread damage and would do the same if another such earthquake or earthquake sequence were to strike today.

[Above: New Madrid earthquakes and seismic zone modified from N. Pinter, 1993, Exercises in Active Tectonic history adapted from *Earthquake Information Bulletin*, 4(3), May-June 1972. *http://earthquake.usgs.gov/regional/states/illinois/history.php*]

The earliest reported earthquake in Illinois was in **1795**. This event was felt at Kaskaskia, IL for a minute and a half and was also felt in Kentucky. At Kaskaskia, subterranean noises were heard. Due to the sparse frontier population, an accurate location is not possible, and the shock may have actually originated outside the state.

An intensity VI-VII earthquake occurred on **April 12, 1883**, awakening several people in Cairo, IL. One old frame house was significantly damaged, resulting in minor injuries to the inhabitants. This is the only record of injury in the state due to earthquakes.

On **October 31, 1895** a large M6.8 occurred at Charleston, Missouri, just south of Cairo. Strong shaking caused eruptions of sand and water at many places along a line roughly 30 km (20 mi) long. Damage occurred in six states, but most severely at Charleston, with cracked walls, windows shattered, broken plaster, and chimneys fallen. Shaking was felt in 23 states from Washington, D.C. to Kansas and from southernmost Canada to New Orleans, LA.

A Missouri earthquake on **November 4, 1905**, cracked walls in Cairo. Aftershocks were felt over an area of 100,000 square miles in nine states. In Illinois, it cracked the wall of the new education building in Cairo and a wall at Carbondale, IL.

Among the largest earthquakes occurring in Illinois was the **May 26, 1909** shock, which knocked over many chimneys at Aurora. It was felt over 500,000 square miles and strongly felt in Iowa and Wisconsin. Buildings swayed in Chicago where there was fear that the walls would collapse. Just under two months later, a second Intensity VII earthquake occurred on **July 18, 1909**, damaged chimneys in Petersburg, IL, Hannibal, MO, and Davenport, IA. Over twenty windows were broken, bricks loosened and plaster cracked in the Petersburg area. This event was felt over 40,000 square miles.

On **November 7, 1958**, a shock along the Indiana border resulted in damage at Bartelso, Dale and Maunie, IL. Plaster cracked and fell, and a basement wall and floor were cracked.

On **August 14, 1965**, a sharp but local shock occurred at Tamms, IL, a town of about 600 people. The magnitude 5 quake damaged chimneys, cracked walls, knocked groceries from the shelves, and muddied the water supply. Thunderous earth noises were heard. This earthquake was only felt within a 10 mile radius of Tamms, in communities such as Elco, Unity, Olive Branch, and Olmstead, IL. Six aftershocks were felt.

An earthquake of Intensity VII occurred on **November 9, 1968**. This magnitude 5.3 shock was felt over an area of 580,000 square miles in 23 states. There were reports of people in tall buildings in Ontario and Boston feeling the shock. Damage consisted of bricks being knocked from chimneys, broken windows, toppled television antenna, and cracked plaster. There were scattered reports of cracked foundations, fallen parapets, and overturned tombstones. Chimney damage was limited to buildings 30 to 50 years old. Many people were frightened. Church bells rang at Broughton and several other towns. Loud rumbling earthquake noise was reported in many communities.

Dozens of other shocks originating in Missouri, Arkansas, Kansas, Nebraska, Tennessee, Indiana, Ohio, Michigan, Kentucky, and Canada have been felt in Illinois without causing damage. There have been three earthquakes slightly greater than magnitude 5.0 and Intensity level VII which occurred in 1968, 1987 and 2008 and that were widely felt throughout southern Illinois and the midcontinent.

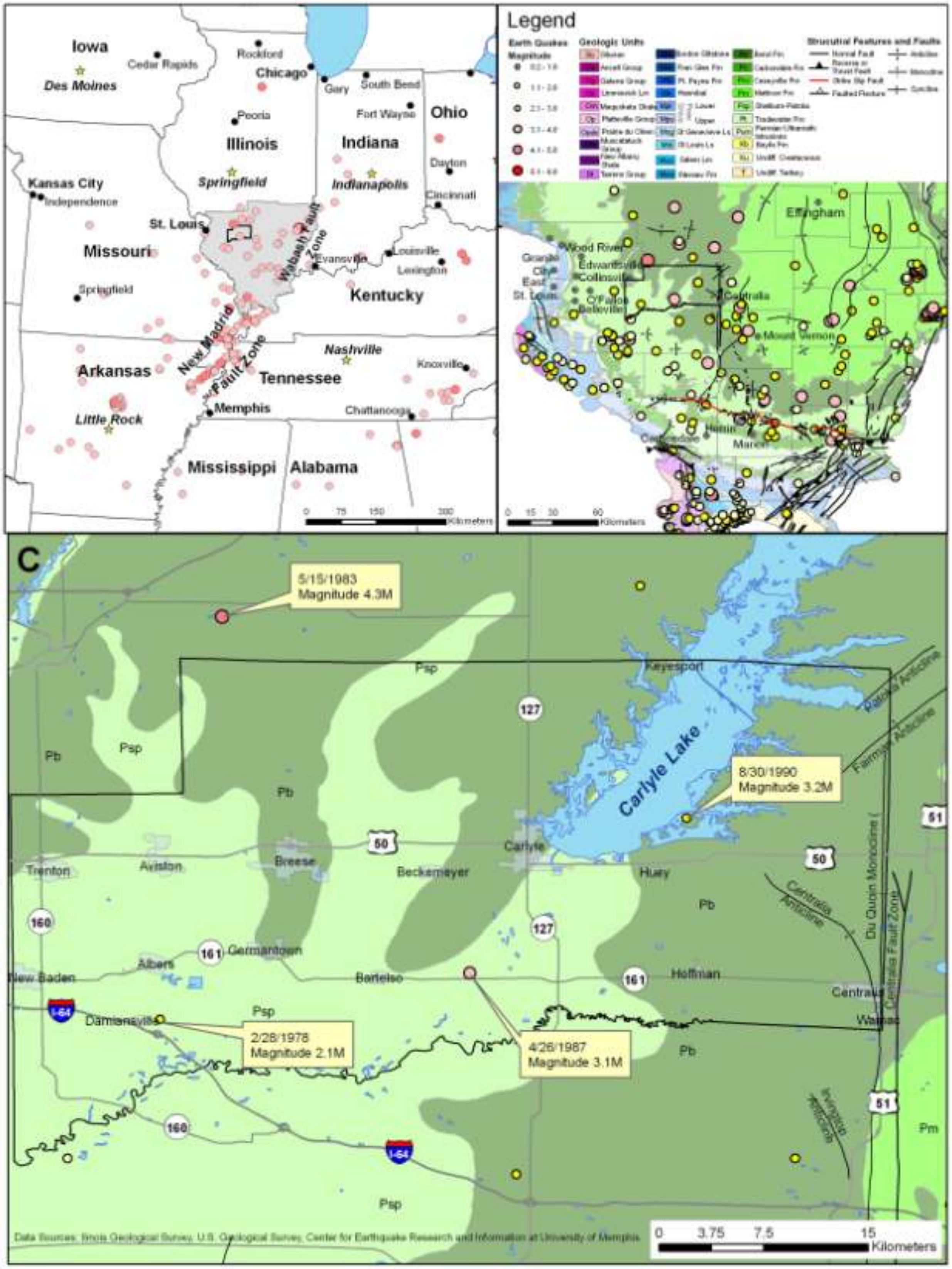
Above text adapted from *http://earthquake.usgs.gov/regional/states/illinois/history.php* and from *Seismicity of the United States, 1568-1989 (Revised), C.W. Stover and J.L. Coffman, U.S. Geological Survey Professional Paper 1527, United States Government Printing Office, Washington: 1993.*

Geographic Location for Earthquake Hazard

Clinton County occupies a region susceptible to earthquakes. Regionally, the two most significant zones of seismic activity are the New Madrid Seismic Zone and the Wabash Valley Fault System. Recently, a third potential seismic zone, the South Central Illinois seismic zone, has been identified. This seismic zone extends from St. Louis, Missouri northeast to the Springfield including Clinton County (Rogers et al. 2010). Since 1975 the epicenters of three small earthquakes (M2.1–3.2) have been recorded in Clinton County (Figure 4-8). The geologic mechanism related to the minor earthquakes is poorly understood. Return periods for large earthquakes within the New Madrid System are estimated to be ~500–1000 years; moderate quakes between magnitude 5.5 and 6.0 can recur within approximately 150 years or less. The Wabash Valley Fault System extends nearly the entire length of southern Illinois and has the potential to generate an earthquake of sufficient strength to cause damage between St. Louis, MO and Indianapolis, IN. The USGS and the Center for Earthquake Research and Information estimate the probability of a repeat of the 1811–1812 type earthquakes (magnitude 7.5–8.0) at 7%–10% and the probability of a magnitude 6.0 or larger at 25%–40% within the next 50 years.

Figure 4-8 depicts the following: a) Location of notable earthquakes in the Illinois region with inset of Clinton County; b) Generalized geologic bedrock map with earthquake epicenters, geologic structures, and inset of Clinton County; c) Geologic and earthquake epicenter map of Clinton County.

Figure 4-8 a, b, c: Clinton County Earthquakes



Hazard Extent for Earthquake Hazard

The extent of the earthquake is countywide.

Calculated Risk Priority Index for Earthquake Hazard

Based on historical information as well as current USGS and SIU research and studies, future earthquakes in Clinton County are possible. According to the Clinton County planning team RPI assessment, earthquake is ranked as the number five hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	4	=	8

Vulnerability Analysis for Earthquake Hazard

This hazard could impact the entire jurisdiction equally; therefore, the entire county's population and all buildings are vulnerable to an earthquake and can expect the same impacts within the affected area. To accommodate this risk this plan will consider all buildings located within the county as vulnerable.

Critical Facilities

All critical facilities are vulnerable to earthquakes. A critical facility would encounter many of the same impacts as any other building within the county. These impacts include structural failure and loss of facility functionality (e.g. damaged police station will no longer be able to serve the community). A complete list of all of the critical facilities, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

Table 4-8 shows building exposure for the entire county. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure and loss of building function, which could result in indirect impacts (e.g. damaged homes will no longer be habitable, causing residence to seek shelter).

Infrastructure

During an earthquake, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since a full inventory of infrastructure is not available for this plan, it is important to emphasize that any number of these items could become damaged in the event of an earthquake. The impacts to these items include broken, failed, or impassable roadways, broken or failed utility lines (e.g. loss of power or gas to community), and railway failure from broken or impassable railways. Bridges could fail or become impassable causing risk to traffic. Typical scenarios are described to gauge the anticipated impacts of earthquakes in the county in terms of number and types of buildings and infrastructure.

The SIU-Polis team reviewed existing geological information and recommendations for earthquake scenarios. Three earthquake scenarios—two based on USGS modeled scenarios and one based on deterministic scenarios were developed to provide a reasonable basis for earthquake planning in Clinton County. The two USGS analyses were a M7.7 event on the New Madrid fault zone and M6.0 earthquake within the South Central Illinois Seismic Zone with the epicenter located along the Shoal Creek in adjacent St. Clair County. The New Madrid and Shoal Creek Shake maps provided by FEMA were used in HAZUS-MH to estimate losses for Clinton County based on these events. The final scenario was a Moment Magnitude of 5.5 with the epicenter located in Clinton County. Note that a deterministic scenario, in this context, refers to hazard or risk models based on specific scenarios without explicit consideration of the probability of their occurrences. This scenario was selected based upon a rupture of a local unnamed fault located five miles southeast of Carlyle, IL and two miles east of Bartelso, IL that presents a realistic earthquake scenario for planning purposes.

Modeling a deterministic scenario requires user input for a variety of parameters. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. Illinois Geologic Survey provided a NEHRP (National Earthquake Hazards Reduction Program) soil classification map for southern Illinois (Bauer and Su, 2007). NEHRP soil classifications portray the degree of shear-wave amplification that can occur during ground shaking.

Earthquake hypocenter depths in southern Illinois range from less than 1.0 to ~25.0 km. The average hypocenter depth, ~10.0 km, was used for the deterministic earthquake scenario. For this scenario type HAZUS-MH also requires the user to define an attenuation function. To maintain consistency with the USGS's (2006) modeling of strong ground motion in the central United States, the Toro et al. (1997) attenuation function was used for the deterministic earthquake scenario.

The building losses are subdivided into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake

Results for 7.7 Magnitude New Madrid Earthquake Scenario

The results of the 7.7 New Madrid Earthquake are depicted in Table 4-22, Table 4-23, and Figure 4-9. HAZUS-MH estimates that approximately 32 buildings will be at least moderately damaged. The total building related losses totaled $9.74 million; 2% of the estimated losses were related to the business interruption of the region. Large losses were sustained by the residential occupancies, which comprised more than 52% of the total loss.

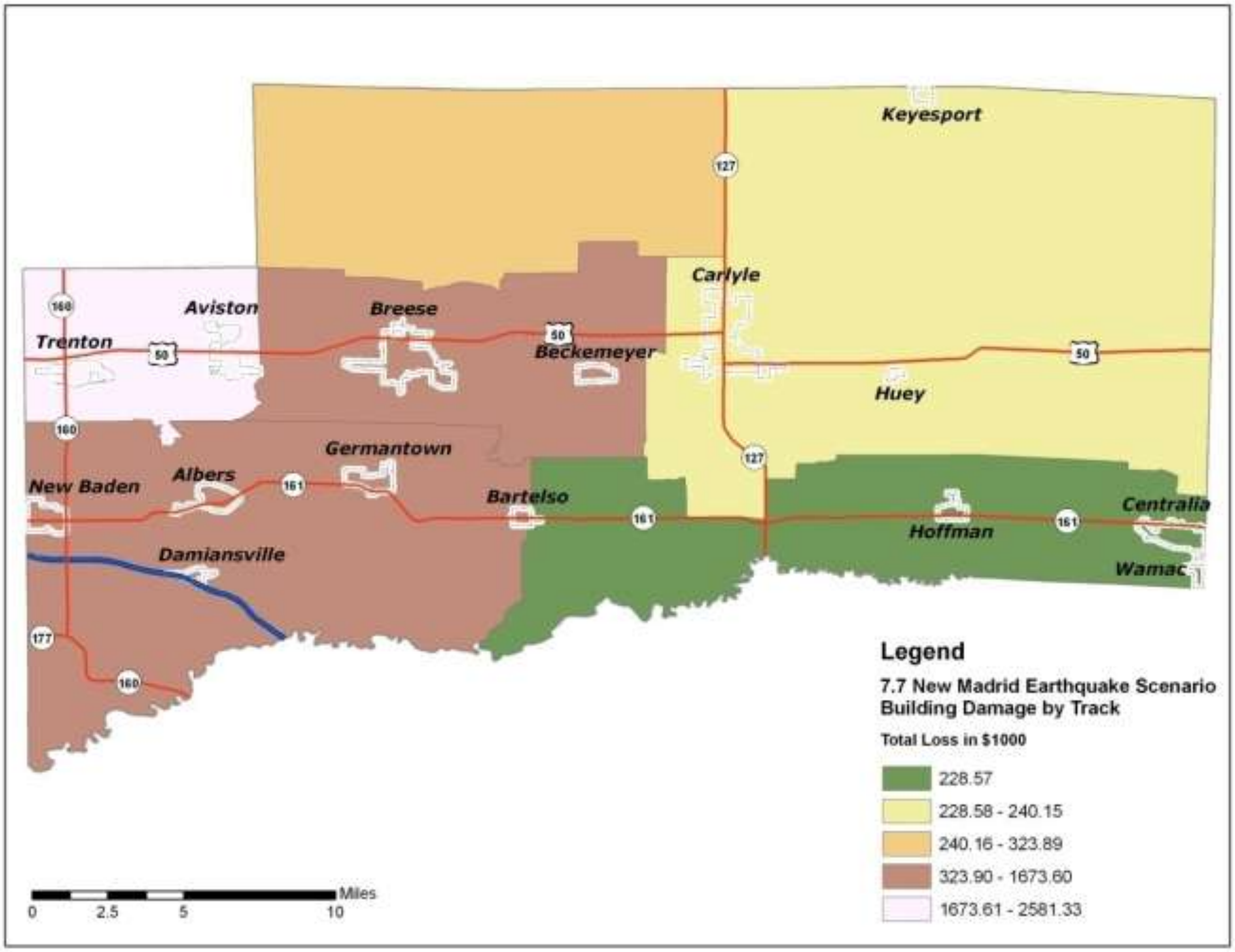
Table 4-22: New Madrid Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	19	0.15	1	0.18	0	0.22	0	0.60	0	0.00
Commercial	212	1.65	5	1.82	1	2.08	0	5.82	0	0.00
Education	10	0.08	0	0.09	0	0.08	0	0.23	0	0.00
Government	16	0.12	0	0.15	0	0.15	0	0.41	0	0.00
Industrial	54	0.42	1	0.49	0	0.63	0	1.64	0	0.00
Other Residential	1,943	15.16	182	60.51	22	69.56	0	3.65	0	0.00
Religion	19	0.14	0	0.15	0	0.15	0	0.43	0	0.00
Single Family	10,542	82.27	110	36.61	9	27.14	0	87.22	0	0.00
Total	**12,815**		**300**		**32**		**0**		**0**	

Table 4-23: New Madrid Scenario-Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.00	0.04	0.00	0.01	0.06
	Capital-Related	0.00	0.00	0.04	0.00	0.00	0.04
	Rental	0.01	0.01	0.04	0.00	0.00	0.07
	Relocation	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.01**	**0.01**	**0.12**	**0.01**	**0.02**	**0.18**
Capital Stock Loses							
	Structural	0.11	0.07	0.07	0.02	0.03	0.31
	Non_Structural	2.17	0.80	1.23	0.58	0.50	5.28
	Content	1.52	0.34	1.01	0.43	0.50	3.80
	Inventory	0.00	0.00	0.05	0.10	0.02	0.17
	Subtotal	**3.80**	**1.21**	**2.37**	**1.12**	**1.06**	**9.56**
	Total	**3.81**	**1.23**	**2.49**	**1.13**	**1.08**	**9.74**

Figure 4-9: New Madrid Valley Scenario-Building Economic Losses in Thousands of Dollars



New Madrid Earthquake Scenario—Essential Facility Losses

Before the earthquake, the region had 1,030 care beds available for use. On the day of the earthquake, the model estimates that only 328 care beds (32%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 88% of the beds will be back in service. By day 30, 97% will be operational.

Results for 6.0 Magnitude Shoal Creek Earthquake Scenario

The results of the 6.0M Shoal Creek Earthquake are depicted in Table 4-24, Table 4-25, and Figure 4-10. HAZUS-MH estimates that approximately 7 buildings will be at least moderately damaged.

The total building related losses totaled $6.5 million; 1% of the estimated losses were related to the business interruption of the region. Large losses were sustained by the residential occupancies, which comprised more than 60% of the total loss.

Table 4-24: Shoal Creek Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	20	0.15	0	0.18	0	0.25	0	0.00	0	0.00
Commercial	216	1.66	2	1.80	0	2.17	0	0.00	0	0.00
Education	10	0.08	0	0.11	0	0.13	0	0.00	0	0.00
Government	16	0.12	0	0.15	0	0.18	0	0.00	0	0.00
Industrial	56	0.43	0	0.38	0	0.50	0	0.00	0	0.00
Other Residential	2,091	16.06	52	45.92	3	42.94	0	0.00	0	0.00
Religion	19	0.14	0	0.19	0	0.23	0	0.00	0	0.00
Single Family	10,599	81.37	59	51.26	4	53.61	0	0.00	0	0.00
Total	**13,025**		**114**		**7**		**0**		**0**	

Table 4-25: Shoal Creek Scenario-Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.00	0.01	0.00	0.01	0.02
	Capital-Related	0.00	0.00	0.01	0.00	0.00	0.01
	Rental	0.01	0.01	0.01	0.00	0.00	0.02
	Relocation	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.01**	**0.01**	**0.03**	**0.00**	**0.01**	**0.05**
Capital Stock Loses							
	Structural	0.05	0.02	0.02	0.00	0.01	0.12
	Non_Structural	1.81	0.46	0.71	0.31	0.29	3.59
	Content	1.32	0.21	0.61	0.23	0.28	2.63
	Inventory	0.00	0.00	0.03	0.05	0.01	0.09
	Subtotal	**3.19**	**0.69**	**1.37**	**0.59**	**0.60**	**6.43**
	Total	**3.19**	**0.69**	**1.41**	**0.59**	**0.61**	**6.48**

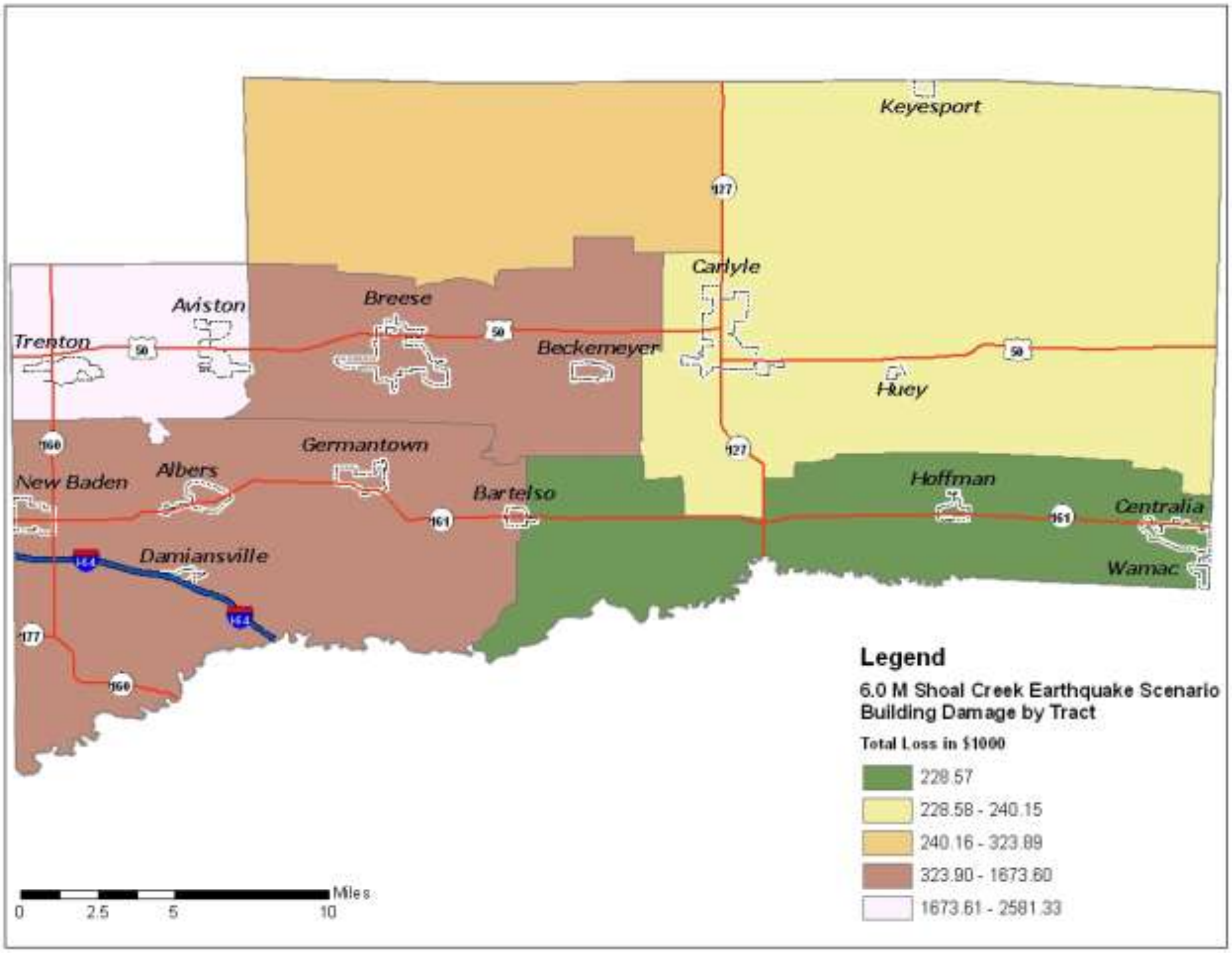


Figure 4-10: Shoal Scenario-Building Economic Losses in Thousands of Dollars

Shoal Creek Scenario—Essential Facility Losses

Before the earthquake, the region had 1,030 care beds available for use. On the day of the earthquake, the model estimates that only 409 care beds (40.0%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 89% of the beds will be back in service. By day 30, 97% will be operational.

Results for 5.5 Magnitude Earthquake in Clinton County

The results of the arbitrary 5.5 magnitude earthquake within Clinton County are depicted in Tables 4-26 and 4-27 and Figure 4-11. HAZUS-MH estimates that approximately 1,487 buildings will be at least moderately damaged. This is more than 11% of the total number of buildings in the region. It is estimated that 43 buildings will be damaged beyond repair.

The total building related losses totaled $121.9 million; 10% of the estimated losses were related to the business interruption of the region. Large losses were sustained by the residential occupancies, which comprised more than 57% of the total loss.

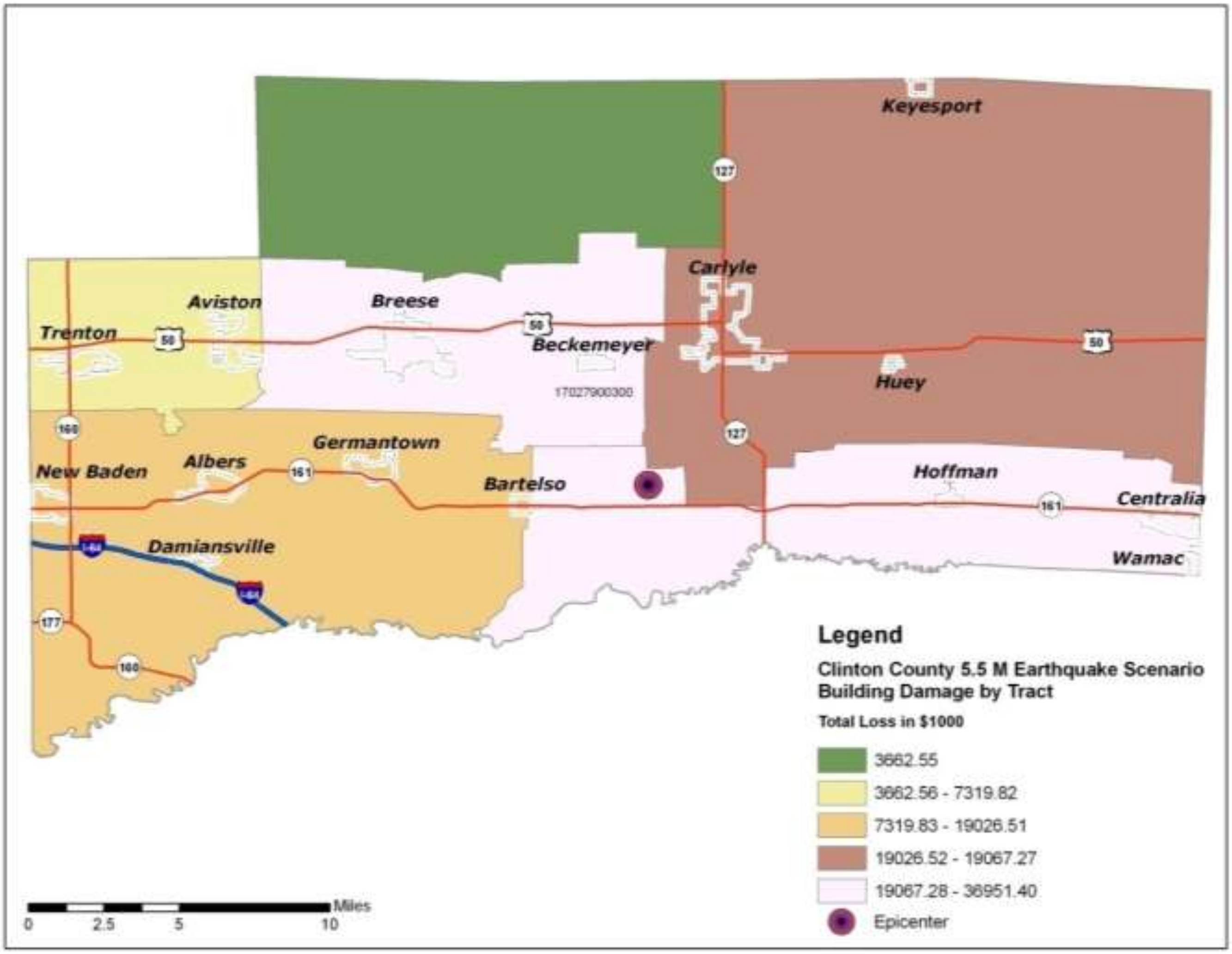
Table 4-26: Clinton County 5.5M Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	13	0.14	4	0.14	3	0.24	1	0.37	0	0.27
Commercial	135	1.47	42	1.71	30	2.53	9	3.82	1	3.31
Education	6	0.06	2	0.08	2	0.14	1	0.21	0	0.28
Government	11	0.12	3	0.11	2	0.15	0	0.18	0	0.20
Industrial	34	0.37	10	0.41	9	0.74	3	1.18	0	0.75
Other Residential	1,234	13.43	467	18.94	385	32.09	57	23.23	4	9.37
Religion	12	0.14	3	0.14	2	0.19	1	0.29	0	0.30
Single Family	7,749	84.29	1,935	78.47	766	63.93	174	70.72	37	85.51
Total	**9,194**		**2,466**		**1,199**		**245**		**43**	

Table 4-27: Clinton County 5.5M Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.33	3.16	0.23	0.47	4.20
	Capital-Related	0.00	0.14	2.61	0.14	0.14	3.03
	Rental	1.31	0.90	1.92	0.08	0.19	4.40
	Relocation	0.15	0.03	0.11	0.01	0.07	0.36
	Subtotal	**1.46**	**1.40**	**7.80**	**0.46**	**0.87**	**12.00**
Capital Stock Loses							
	Structural	7.73	2.37	4.33	0.96	2.01	17.40
	Non_Structural	31.14	9.69	10.91	3.85	5.27	60.87
	Content	13.16	3.01	7.29	2.91	3.99	30.36
	Inventory	0.00	0.00	0.40	0.69	0.14	1.22
	Subtotal	**52.04**	**15.07**	**22.93**	**8.41**	**11.41**	**109.86**
	Total	**53.50**	**16.47**	**30.73**	**8.87**	**12.28**	**121.86**

Figure 4-11: Clinton County 5.5M Scenario-Building Economic Losses in Thousands of Dollars



Arbitrary Earthquake Scenario—Essential Facility Losses

Before the earthquake, the region had 1,030 care beds available for use. On the day of the earthquake, the model estimates that only 103 care beds (10.0%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 70% of the beds will be back in service. By day 30, 90.0% will be operational.

Vulnerability to Future Assets/Infrastructure for Earthquake Hazard

New construction, especially critical facilities, will accommodate earthquake mitigation design standards.

Analysis of Community Development Trends

Community development will occur outside of the low-lying areas in floodplains with a water table within five feet of grade which are susceptible to liquefaction. Furthermore, Clinton County will continue to provide training to county officials, implement public education, and institute leaders who are proactive in mapping and studying the risks of earthquakes in the county.

4.4.4 Thunderstorm Hazard

Hazard Definition for Thunderstorm Hazard

Severe thunderstorms are defined as thunderstorms with one or more of the following characteristics: strong winds, large damaging hail, and frequent lightning. Severe thunderstorms most frequently occur in Illinois in the spring and summer months and in the late afternoon or evening, but can occur any month of the year at any time of day. A severe thunderstorm's impacts can be localized or can be widespread in nature. A thunderstorm is classified as severe when it meets one of more of the following criteria:

- Hail of diameter 0.75 inches or higher
- Frequent and dangerous lightning
- Wind speeds equal to or greater than 58 mph

Hail

Hail can be a product of a strong thunderstorm. Hail usually falls near the center of a storm; however strong winds occurring at high altitudes in the thunderstorm can blow the hailstones away from the storm center, resulting in a broader distribution. Hailstones range from pea-sized to baseball-sized, but hailstones larger than softballs have been reported on rare occasions.

Lightning

Lightning is a discharge of electricity from a thunderstorm. Lightning is often perceived as a minor hazard, but in reality lightning causes damage to many structures and kills or severely injures numerous people in the United States each year.

Severe Winds (Straight-Line Winds)

Straight-line winds from thunderstorms are a fairly common occurrence across Illinois. Straight-line winds can cause damage to homes, businesses, power lines, and agricultural areas and may require temporary sheltering of individuals who are without power for extended periods of time.

Previous Occurrences for Thunderstorm Hazard

The NCDC database reported 56 hailstorms in Clinton County since 1957. Hailstorms occur nearly every year in the late spring and early summer months. The most recent significant occurrence of hail occurred in August 2007 when severe thunderstorms produced a swath of golf-ball size hail crossed east-central Clinton County impacting the villages of New Baden and Aviston.

Clinton County hailstorms are listed in Table 4-28; additional details for NCDC events are included in Appendix D.

Table 4-28: Clinton County Hailstorms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Clinton	5/21/1957	Hail	1.50 in.	0	0	0
Clinton	5/24/1960	Hail	1.75 in.	0	0	0
Clinton	8/3/1967	Hail	3.00 in.	0	0	0
Clinton	4/3/1974	Hail	1.75 in.	0	0	0
Clinton	9/6/1980	Hail	0.75 in.	0	0	0
Clinton	6/7/1982	Hail	0.75 in.	0	0	0
Clinton	9/6/1983	Hail	1.75 in.	0	0	0
Clinton	9/6/1983	Hail	1.75 in.	0	0	0
Clinton	3/10/1986	Hail	0.75 in.	0	0	0
Clinton	4/7/1986	Hail	0.75 in.	0	0	0
Clinton	4/7/1986	Hail	0.75 in.	0	0	0
Clinton	6/2/1987	Hail	1.75 in.	0	0	0
Clinton	11/15/1989	Hail	1.00 in.	0	0	0
Clinton	11/15/1989	Hail	1.75 in.	0	0	0
Carlyle	5/18/1995	Hail	1.75 in.	0	0	0
Farina	5/18/1995	Hail	0.75 in.	0	0	0
Boulder	5/3/1996	Hail	0.75 in.	0	0	0
Boulder	5/3/1996	Hail	1.50 in.	0	0	0
Trenton	5/21/1998	Hail	1.00 in.	0	0	0
St Rose	2/27/1999	Hail	1.00 in.	0	0	0
Trenton	2/27/1999	Hail	1.00 in.	0	0	0
Keyesport	2/27/1999	Hail	1.00 in.	0	0	0
Posey	4/7/2000	Hail	0.75 in.	0	0	0
Germantown	5/12/2000	Hail	0.75 in.	0	0	0
Stolletown	10/4/2000	Hail	1.00 in.	0	0	0
Aviston	4/4/2003	Hail	1.00 in.	0	0	0
Breese	3/20/2004	Hail	0.75 in.	0	0	0
Trenton	5/25/2004	Hail	0.75 in.	0	0	0
Breese	5/27/2004	Hail	0.88 in.	0	0	0
Breese	5/30/2004	Hail	2.75 in.	0	0	0
Breese	5/30/2004	Hail	1.75 in.	0	0	0
Albers	7/22/2004	Hail	0.88 in.	0	0	0
Germantown	7/22/2004	Hail	0.88 in.	0	0	0
Germantown	7/22/2004	Hail	0.88 in.	0	0	0
Carlyle	7/22/2004	Hail	1.00 in.	0	0	0
Aviston	3/31/2005	Hail	0.88 in.	0	0	0
Breese	3/31/2005	Hail	1.25 in.	0	0	0
Breese	4/12/2005	Hail	0.75 in.	0	0	0
Breese	5/19/2005	Hail	1.00 in.	0	0	0
Bartelso	6/6/2005	Hail	0.75 in.	0	0	0
Germantown	7/4/2005	Hail	1.00 in.	0	0	0
Albers	11/5/2005	Hail	1.00 in.	0	0	0
Carlyle	4/7/2006	Hail	1.00 in.	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Bartelso	4/7/2006	Hail	0.88 in.	0	0	0
New Memphis	4/30/2006	Hail	0.75 in.	0	0	0
New Memphis	4/30/2006	Hail	1.00 in.	0	0	0
Carlyle	4/30/2006	Hail	0.75 in.	0	0	0
St Rose	5/24/2006	Hail	1.75 in.	0	0	0
Keyesport	5/24/2006	Hail	1.00 in.	0	0	0
Aviston	7/21/2006	Hail	1.25 in.	0	0	0
Trenton	3/1/2007	Hail	0.88 in.	0	0	0
Beckemeyer	4/3/2007	Hail	0.75 in.	0	0	0
Carlyle	4/3/2007	Hail	0.88 in.	0	0	0
New Baden	8/24/2007	Hail	1.00 in.	0	0	0
Aviston	8/24/2007	Hail	1.00 in.	0	0	0

Source: NCDC

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

The NCDC database identified 136 wind storms reported since 1957. On multiple occasions in the past 50 years trees have been uprooted by severe winds in Clinton County. These storms have been attributed with $1.2 million in property damage in Clinton and adjacent counties.

As shown in Table 4-28, wind storms have historically occurred year-round with the greatest frequency and damage in April through August.

Table 4-29: Clinton County Wind Storms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Clinton	5/21/1957	Thunderstorm Winds	65 kts.	0	0	0
Clinton	7/19/1958	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/19/1958	Thunderstorm Winds	0 kts.	0	0	0
Clinton	11/16/1958	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/31/1968	Thunderstorm Winds	0 kts.	0	0	0
Clinton	6/1/1969	Thunderstorm Winds	0 kts.	0	0	0
Clinton	6/22/1969	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/3/1969	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/3/1969	Thunderstorm Winds	0 kts.	0	0	0
Clinton	4/3/1974	Thunderstorm Winds	65 kts.	0	0	0
Clinton	6/9/1974	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/5/1975	Thunderstorm Winds	0 kts.	0	0	0
Clinton	2/21/1976	Thunderstorm Winds	0 kts.	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Clinton	3/4/1976	Thunderstorm Winds	0 kts.	0	0	0
Clinton	3/29/1976	Thunderstorm Winds	0 kts.	0	0	0
Clinton	10/22/1979	Thunderstorm Winds	0 kts.	0	0	0
Clinton	4/7/1980	Thunderstorm Winds	0 kts.	0	0	0
Clinton	6/19/1980	Thunderstorm Winds	55 kts.	0	0	0
Clinton	9/6/1980	Thunderstorm Winds	0 kts.	0	0	0
Clinton	4/2/1982	Thunderstorm Winds	0 kts.	0	0	0
Clinton	5/1/1983	Thunderstorm Winds	0 kts.	0	0	0
Clinton	6/3/1983	Thunderstorm Winds	0 kts.	0	0	0
Clinton	8/5/1983	Thunderstorm Winds	60 kts.	0	0	0
Clinton	3/15/1984	Thunderstorm Winds	0 kts.	0	0	0
Clinton	3/15/1984	Thunderstorm Winds	0 kts.	0	0	0
Clinton	3/15/1984	Thunderstorm Winds	0 kts.	0	0	0
Clinton	8/8/1984	Thunderstorm Winds	52 kts.	0	0	0
Clinton	4/5/1985	Thunderstorm Winds	0 kts.	0	0	0
Clinton	11/19/1985	Thunderstorm Winds	52 kts.	0	0	0
Clinton	7/9/1986	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/9/1986	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/9/1986	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/9/1986	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/6/1987	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/26/1987	Thunderstorm Winds	59 kts.	0	0	0
Clinton	5/9/1990	Thunderstorm Winds	0 kts.	0	0	0
Clinton	5/15/1990	Thunderstorm Winds	56 kts.	0	0	0
Clinton	5/15/1990	Thunderstorm Winds	0 kts.	0	0	0
Clinton	8/8/1991	Thunderstorm Winds	0 kts.	0	0	0
Clinton	11/29/1991	Thunderstorm Winds	0 kts.	0	0	0
Clinton	4/16/1992	Thunderstorm Winds	0 kts.	0	0	0
Clinton	7/4/1992	Thunderstorm Winds	70 kts.	0	0	0
Germantown	4/15/1994	Thunderstorm Winds	N/A	0	0	1K
Hoffman	4/15/1994	Thunderstorm Winds	N/A	0	0	1K
Trenton	4/26/1994	Thunderstorm Winds	N/A	0	0	1K
Clinton	4/18/1995	High Winds	0 kts.	0	0	400K
Breese	5/16/1995	Thunderstorm Winds	N/A	0	0	0
Breese	5/16/1995	Thunderstorm Winds	N/A	0	0	1K

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Breese	5/16/1995	Thunderstorm Winds	N/A	0	0	0
Albers	5/18/1995	Thunderstorm Winds	N/A	0	0	0K
Hoffman	5/18/1995	Thunderstorm Winds	N/A	0	0	3K
St.rose	5/27/1995	Thunderstorm Winds	N/A	0	0	246
Keyesport	6/20/1995	Thunderstorm Winds	N/A	0	0	105
Bartelso	1/18/1996	Thunderstorm Winds	50 kts.	0	0	0
Beckemeyer	5/25/1996	Thunderstorm Winds	55 kts.	0	0	5K
Carlyle	5/25/1996	Thunderstorm Winds	55 kts.	0	0	5K
Clinton	9/26/1996	High Wind	45 kts.	0	0	140K
Trenton	10/17/1996	Thunderstorm Winds	51 kts.	0	0	0
Clinton	4/30/1997	High Wind	45 kts.	0	0	0
Boulder	6/21/1997	Thunderstorm Winds	52 kts.	0	0	0
Germantown	6/21/1997	Thunderstorm Winds	52 kts.	0	0	0
New Baden	6/21/1997	Thunderstorm Winds	52 kts.	0	0	0
Germantown	7/14/1997	Thunderstorm Winds	50 kts.	0	0	0
Albers	7/14/1997	Thunderstorm Winds	50 kts.	0	0	0
Trenton	9/2/1997	Thunderstorm Winds	51 kts.	0	0	0
Trenton	5/23/1998	Thunderstorm Winds	55 kts.	0	0	0
Breese	5/23/1998	Thunderstorm Winds	55 kts.	0	0	0
New Memphis	6/12/1998	Thunderstorm Winds	57 kts.	0	0	0
Albers	6/12/1998	Thunderstorm Winds	57 kts.	0	0	0
Huey	6/12/1998	Thunderstorm Winds	57 kts.	0	0	0
Albers	6/18/1998	Thunderstorm Winds	60 kts.	0	0	0
Bartelso	6/18/1998	Thunderstorm Winds	60 kts.	0	0	0
Carlyle	6/18/1998	Thunderstorm Winds	60 kts.	0	0	0
Hoffman	6/18/1998	Thunderstorm Winds	60 kts.	0	0	0
New Memphis	6/20/1998	Thunderstorm Winds	55 kts.	0	0	0
Germantown	5/17/1999	Thunderstorm Winds	55 kts.	0	0	0
Hoffman	5/17/1999	Thunderstorm Winds	55 kts.	0	0	75K
Carlyle	6/4/1999	Thunderstorm Winds	55 kts.	0	0	0
Trenton	6/4/1999	Thunderstorm Winds	55 kts.	0	0	0
Breese	6/14/2000	Thunderstorm Winds	52 kts.	0	0	0
Breese	6/24/2000	Thunderstorm Winds	52 kts.	0	0	0
Carlyle	8/17/2000	Thunderstorm Winds	55 kts.	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Carlyle	8/17/2000	Thunderstorm Winds	60 kts.	0	0	0
Trenton	8/17/2000	Thunderstorm Winds	60 kts.	0	0	0
Stolletown	10/4/2000	Thunderstorm Winds	65 kts.	0	0	210K
Clinton	3/13/2001	High Wind	45 kts.	0	0	0
Aviston	8/18/2001	Thunderstorm Winds	55 kts.	0	0	0
Breese	8/18/2001	Thunderstorm Winds	55 kts.	0	0	0
Beckemeyer	8/18/2001	Thunderstorm Winds	55 kts.	0	0	0
Trenton	8/24/2001	Thunderstorm Winds	57 kts.	0	0	0
Aviston	8/24/2001	Thunderstorm Winds	57 kts.	0	0	0
New Baden	8/25/2001	Thunderstorm Winds	52 kts.	0	0	0
Breese	4/27/2002	Thunderstorm Winds	55 kts.	0	0	0
Breese	5/9/2002	Thunderstorm Winds	60 kts.	0	0	0
Breese	5/9/2002	Thunderstorm Winds	60 kts.	0	0	0
Breese	5/9/2002	Thunderstorm Winds	60 kts.	0	0	0
Carlyle	5/9/2002	Thunderstorm Winds	60 kts.	0	0	0
Trenton	6/11/2002	Thunderstorm Winds	55 kts.	0	0	0
Carlyle	6/11/2002	Thunderstorm Winds	55 kts.	0	0	0
Trenton	7/22/2002	Thunderstorm Winds	55 kts.	0	0	0
Aviston	7/22/2002	Thunderstorm Winds	55 kts.	0	0	0
Breese	6/10/2003	Thunderstorm Winds	61 kts.	0	0	0
Trenton	6/10/2003	Thunderstorm Winds	70 kts.	0	0	0
New Baden	6/10/2003	Thunderstorm Winds	70 kts.	0	0	0
Trenton	7/18/2003	Thunderstorm Winds	58 kts.	0	0	0
Clinton	11/17/2003	Heavy Rain	N/A	0	0	0
Jamestown	5/30/2004	Thunderstorm Winds	55 kts.	0	0	0
Trenton	5/30/2004	Thunderstorm Winds	55 kts.	0	0	0
Trenton	7/5/2004	Thunderstorm Winds	65 kts.	0	0	0
Aviston	7/5/2004	Thunderstorm Winds	60 kts.	0	0	0
Germantown	7/5/2004	Thunderstorm Winds	65 kts.	0	0	0
Carlyle	7/5/2004	Thunderstorm Winds	60 kts.	0	0	0
Trenton	7/5/2004	Thunderstorm Winds	55 kts.	0	0	0
Bartelso	7/5/2004	Thunderstorm Winds	55 kts.	0	0	0
Germantown	7/5/2004	Thunderstorm Winds	55 kts.	0	0	0
Breese	7/5/2004	Thunderstorm Winds	52 kts.	0	0	0
Germantown	7/22/2004	Thunderstorm Winds	51 kts.	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Hoffman	8/19/2004	Thunderstorm Winds	55 kts.	0	0	0
Breese	6/8/2005	Thunderstorm Winds	55 kts.	0	0	0
St Rose	6/8/2005	Thunderstorm Winds	55 kts.	0	0	0
Albers	7/4/2005	Thunderstorm Winds	55 kts.	0	0	0
Breese	7/4/2005	Thunderstorm Winds	55 kts.	0	0	0
Carlyle	7/4/2005	Thunderstorm Winds	55 kts.	0	0	0
Trenton	8/13/2005	Thunderstorm Winds	55 kts.	0	0	0
Shattuc	11/15/2005	Thunderstorm Winds	56 kts.	0	0	0
Shattuc	2/16/2006	Thunderstorm Winds	52 kts.	0	0	0
Aviston	4/2/2006	Thunderstorm Winds	55 kts.	0	0	0
Breese	4/2/2006	Thunderstorm Winds	55 kts.	0	0	0
Posey	4/2/2006	Thunderstorm Winds	55 kts.	0	0	0
Bartelso	7/21/2006	Thunderstorm Winds	65 kts.	0	0	0
Trenton	7/21/2006	Thunderstorm Winds	65 kts.	0	0	0
Aviston	7/21/2006	Thunderstorm Winds	61 kts.	0	0	0
Germantown	7/21/2006	Thunderstorm Winds	60 kts.	0	0	0
Shattuc	8/3/2007	Thunderstorm Wind	N/A	0	0	0K
Aviston	8/24/2007	Thunderstorm Wind	N/A	0	0	0K

Source: NCDC

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Thunderstorm Hazard

The entire county has the same risk for occurrence of thunderstorms. They can occur at any location within the county.

Hazard Extent for Thunderstorm Hazard

The extent of the historical thunderstorms listed previously varies in terms of the extent of the storm, the wind speed, and the size of hailstones. Thunderstorms can occur at any location within the county.

Calculated Risk Priority Index for Thunderstorm Hazard

Based on historical information, the probability of future high wind damage is likely. High winds with widely varying magnitudes are expected to happen. According to the planning team, thunderstorms and high wind damage ranked as the number two hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
4	x	2	=	8

Vulnerability Analysis for Thunderstorm Hazard

Severe thunderstorms are an evenly distributed threat across the entire jurisdiction; therefore, the entire county's population and all buildings are susceptible to severe thunderstorms and can expect the same impacts. This plan will therefore consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Clinton County are discussed in types and numbers in Table 4-9.

Critical Facilities

All critical facilities are vulnerable to severe thunderstorms. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure, debris (trees or limbs) causing damage, roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of function of the facility (e.g. a damaged police station will no longer be able to serve the community). Table 4-7 lists the types and numbers of all essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is provided in Table 4-8. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, debris (trees or limbs) causing damage, roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g. a damaged home will no longer be habitable causing residence to seek shelter).

Infrastructure

During a severe thunderstorm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these items could become damaged during a severe thunderstorm. The impacts to these items include broken, failed or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could fail or become impassable causing risk to traffic.

Vulnerability to Future Assets/Infrastructure for Thunderstorm Hazard

All future development within the county and all communities will remain vulnerable to these events.

Analysis of Community Development Trends

Preparing for severe storms will be enhanced if officials sponsor a wide range of programs and initiatives to address the overall safety of county residents. New structures need to be built with more sturdy construction, and those structures already in place need to be hardened to lessen the potential impacts of severe weather. Community warning sirens to provide warning of approaching storms are also vital to preventing the loss of property and ensuring the safety of Clinton County residents.

4.4.5 Winter Storm Hazard

Hazard Definition for Winter Storm Hazard

Severe winter weather consists of various forms of precipitation and strong weather conditions. This may include one or more of the following conditions: freezing rain, sleet, heavy snow, blizzards, icy roadways, extreme low temperatures, and strong winds. These conditions can cause human health risks such as frostbite, hypothermia, and death.

Ice (glazing) and Sleet Storms

Ice or sleet, even in small quantities, can result in hazardous driving conditions and can cause property damage. Sleet involves frozen raindrops that bounce when they hit the ground or other objects. Sleet does not stick to trees and wires. Ice storms, on the other hand, involve liquid rain that falls through subfreezing air and/or onto sub-freezing surfaces, freezing on contact with those surfaces. The ice coats trees, buildings, overhead wires, and roadways, sometimes causing extensive damage.

The most damaging winter storms in southern Illinois have been ice storms. Ice storms occur when moisture-laden gulf air converges with the northern jet stream causing strong winds and heavy precipitation. This precipitation takes the form of freezing rain coating power and communication lines and trees with heavy ice. The winds will then cause the overburdened limbs and cables to snap; leaving large sectors of the population without power, heat, or communication. In the past few decades, including the winter of 2007–08, numerous ice storm events have occurred in southern Illinois.

Snow Storms

Significant snow storms are characterized by the rapid accumulation of snow, often accompanied by high winds, cold temperatures, and low visibility. A blizzard is categorized as a snow storm with winds of 35 miles per hour or greater and/or visibility of less than ¼ mile for three or more hours. Blizzards are the most dramatic and perilous of all winter storm events. Most snow within a blizzard is in the form of fine, powdery particles, which are wind-blown in such great quantities that visibility is reduced to only a few feet. Blizzards have the potential to result in property damage.

Illinois has repeatedly been struck by blizzards, although they are less common in the southern part of the state. Blizzard conditions can cause power outages, loss of communication, and make transportation impossible. The blowing of snow can reduce visibility to less than ¼ mile, resulting in disorientation that can make even travel by foot dangerous.

Severe Cold

Severe cold is characterized by the ambient air temperature that may drop to 0°F or below. These extreme temperatures can increase the likelihood of frostbite and hyperthermia. High winds during severe cold events can enhance the air temperature's effects. Fast winds during cold weather events can lower the Wind Chill Factor (how cold the air feels on your skin), which can lower the time it takes for frostbite and hypothermia to affect a person's body.

Previous Occurrences for Winter Storm Hazard

The NCDC database identified 29 winter storm and extreme cold events for Clinton County since 1996. These storms have been attributed with one death. A recent example a severe winter storm occurred in February 2008 when a winter storm dropped from one half to two inches of sleet across Southwest Illinois. At least 100 auto accidents were reported across the area. Most areas schools were closed on the 21st and the 22nd.

The NCDC winter storms for Clinton County are listed in Table 4-30. Additional details for NCDC events are included in Appendix D.

Table 4-30: Winter Storm Events*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Clinton	11/25/1996	Winter Storm	N/A	0	0	0
Clinton	1/8/1997	Winter Storm	N/A	0	0	0
Clinton	1/15/1997	Winter Storm	N/A	0	0	0
Clinton	1/12/1998	Winter Storm	N/A	0	0	0
Clinton	12/21/1998	Winter Storm	N/A	0	0	0
Clinton	1/1/1999	Winter Storm	N/A	0	0	0
Clinton	1/13/1999	Ice Storm	N/A	0	0	0
Clinton	1/28/2000	Winter Storm	N/A	0	0	0
Clinton	3/11/2000	Winter Storm	N/A	0	0	0
Clinton	12/13/2000	Heavy Snow	N/A	0	0	0
Clinton	12/16/2000	Extreme Windchill	N/A	1	0	0
Clinton	1/26/2001	Winter Storm	N/A	0	0	0
Clinton	12/4/2002	Winter Storm	N/A	0	0	0
Clinton	12/24/2002	Winter Storm	N/A	0	0	0
Clinton	2/15/2003	Winter Storm	N/A	0	0	0
Clinton	2/23/2003	Winter Storm	N/A	0	0	0
Clinton	1/25/2004	Winter Storm	N/A	0	0	0
Clinton	12/22/2004	Winter Storm	N/A	0	0	0
Clinton	12/8/2005	Winter Storm	N/A	0	0	0
Clinton	11/30/2006	Winter Storm	N/A	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Clinton	12/1/2006	Winter Storm	N/A	0	0	0
Clinton	1/12/2007	Ice Storm	N/A	0	0	0
Clinton	4/4/2007	Frost/freeze	N/A	0	0	0
Clinton	12/8/2007	Winter Weather	N/A	0	0	0
Clinton	12/15/2007	Heavy Snow	N/A	0	0	0
Clinton	1/31/2008	Heavy Snow	N/A	0	0	0
Clinton	2/1/2008	Heavy Snow	N/A	0	0	0
Clinton	2/11/2008	Winter Weather	N/A	0	0	0
Clinton	2/21/2008	Sleet	N/A	0	0	0
Clinton	11/25/1996	Winter Storm	N/A	0	0	0
Clinton	1/8/1997	Winter Storm	N/A	0	0	0
Clinton	1/15/1997	Winter Storm	N/A	0	0	0
Clinton	1/12/1998	Winter Storm	N/A	0	0	0
Clinton	12/21/1998	Winter Storm	N/A	0	0	0
Clinton	1/1/1999	Winter Storm	N/A	0	0	0
Clinton	1/13/1999	Ice Storm	N/A	0	0	0
Clinton	1/28/2000	Winter Storm	N/A	0	0	0
Clinton	3/11/2000	Winter Storm	N/A	0	0	0
Clinton	12/13/2000	Heavy Snow	N/A	0	0	0
Clinton	12/16/2000	Extreme Windchill	N/A	1	0	0
Clinton	1/26/2001	Winter Storm	N/A	0	0	0
Clinton	12/4/2002	Winter Storm	N/A	0	0	0
Clinton	12/24/2002	Winter Storm	N/A	0	0	0
Clinton	2/15/2003	Winter Storm	N/A	0	0	0
Clinton	2/23/2003	Winter Storm	N/A	0	0	0
Clinton	1/25/2004	Winter Storm	N/A	0	0	0
Clinton	12/22/2004	Winter Storm	N/A	0	0	0
Clinton	12/8/2005	Winter Storm	N/A	0	0	0
Clinton	11/30/2006	Winter Storm	N/A	0	0	0
Clinton	12/1/2006	Winter Storm	N/A	0	0	0
Clinton	1/12/2007	Ice Storm	N/A	0	0	0
Clinton	4/4/2007	Frost/freeze	N/A	0	0	0
Clinton	12/8/2007	Winter Weather	N/A	0	0	0
Clinton	12/15/2007	Heavy Snow	N/A	0	0	0
Clinton	1/31/2008	Heavy Snow	N/A	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage
Clinton	2/1/2008	Heavy Snow	N/A	0	0	0
Clinton	2/11/2008	Winter Weather	N/A	0	0	0
Clinton	2/21/2008	Sleet	N/A	0	0	0

Source: NCDC

* NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Winter Storm Hazard

Severe winter storms are regional in nature. Most of the NCDC data is calculated regionally or in some cases statewide.

Hazard Extent for Winter Storm Hazard

The extent of the historical winter storms listed previously varies in terms of storm extent, temperature, and ice or snowfall. Severe winter storms affect the entire jurisdiction equally.

Calculated Risk Priority Index for Winter Storm Hazard

Based on historical information, the probability of future winter storms are probable. Winter storms of varying magnitudes are expected to happen. According to the Clinton County planning team RPI assessment, winter storms ranked as the number thrid highest hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	**4**	=	**8**

Vulnerability Analysis for Winter Storm Hazard

Winter storm impacts are evenly distributed across the jurisdiction; therefore the entire county is vulnerable to winter storms and can expect the same impacts within the affected area. The building exposure for Clinton County, as determined from the building inventory, is included in Table 4-8.

Critical Facilities

All critical facilities are vulnerable to a winter storm. A critical facility will encounter many of the same impacts as any other buildings within the jurisdiction. These impacts include loss of gas or electricity from broken or damaged utility lines, roads and railways damaged or impassable, broken water pipes, and roof collapse from heavy snow. Table 4-7 lists the types and numbers of the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

Table 4-8 lists the building exposure in terms of types and numbers of buildings for the entire county. The impacts to the building stock within the county are similar to the damages expected to the critical facilities, including loss of gas of electricity from broken or damaged utility lines, roads and railways damaged or impassable, broken water pipes, and roof collapse from heavy snow.

Infrastructure

During a winter storm, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads and bridges. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these items could become damaged during a winter storm. Potential impacts include broken gas and/or electricity lines, or damaged utility lines, damaged or impassable roads and railways, and broken water pipes.

Vulnerability to Future Assets/Infrastructure for Winter Storm Hazard

Any new development within the county will remain vulnerable to these events.

Analysis of Community Development Trends

Because the winter storm events are regional in nature, future development will be impacted across the county. Rural areas in Clinton County are particularly vulnerable due to the likely hood of long term power outages. Human service agencies, volunteer organizations, the Clinton County Health Department, medical and health care facilities, and schools have definite roles to play in public education, planning, and response to extreme winter conditions.

4.4.6 Hazardous Materials Storage and Transport Hazard

Hazard Definition for Hazardous Materials Storage and Transport Hazard

Explosions result from the ignition of volatile materials such as petroleum products, natural gas and other flammable gases, hazardous materials/chemicals and dust, and explosive devices. An explosion can potentially cause death, injury, and property damage. In addition, a fire routinely follows an explosion, which may cause further damage and inhibit emergency response. Emergency response may require fire, safety/law enforcement, search and rescue, and hazardous materials units.

Previous Occurrences for Hazardous Materials Storage and Transport Hazard

Clinton County has not experienced a significant or large-scale hazardous material incident at a fixed site or transportation route that has resulted in multiple deaths or serious injuries.

Geographic Location for Hazardous Materials Storage and Transport Hazard

The hazardous material hazards are countywide and are primarily associated with the transport of materials via highway or rail.

Hazard Extent for Hazardous Materials Storage and Transport Hazard

The extent of the hazardous material hazard varies both in terms of the quantity of material being transported as well as the specific content of the container.

Calculated Risk Priority Index for Hazardous Materials Storage and Transport Hazard

The possibility of a hazardous materials accident is possible, based on input from the planning team. According to the RPI, Hazardous Materials Storage and Transport ranked as the fourth highest hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
2	x	**2**	=	**4**

Vulnerability Analysis for Hazardous Materials Storage and Transport Hazard

Hazardous material impacts are evenly distributed across the jurisdiction; therefore the entire county is vulnerable to a release associated with hazardous materials storage or transport and can expect the same impacts within the affected area. The building exposure for Clinton County, as determined from building inventory, is included in Table 4-8. This plan will therefore consider all buildings located within the county as vulnerable.

Critical Facilities

All critical facilities and communities within the county are at risk. A critical facility, if vulnerable, will encounter many of the same impacts as other buildings within the jurisdiction. These impacts include structural failure due to fire or explosion and loss of function of the facility (e.g. a damaged police station will no longer be able to serve the community). Table 4-7 lists the types and numbers of all essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

Table 4-8 lists the building exposure in terms of type and number of buildings for the entire county. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure due to fire or explosion or debris and loss of function of the building (e.g. a damaged home will no longer be habitable causing residence to seek shelter).

Infrastructure

During a hazardous materials release, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since a full inventory of infrastructure is not available for this plan, it is important to emphasize that any number of these items could become damaged in the event of a hazardous material release. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); and railway failure from broken or impassable railways. Bridges could fail or become impassable causing risk to traffic.

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) is a computer program designed especially for use by people responding to chemical accidents, as well as for emergency planning and training. ALOHA was utilized to assess the area of impact for an Ammonia release at the intersection of Germantown Road and the CSX railroad line in Breese, IL. Rail tankers commonly transport Ammonia and other hazardous materials through the Breese and other municipalities in Clinton County.

Ammonia is clear colorless liquid consisting of ammonia dissolved in water. It is corrosive to tissue and metals. Although ammonia is lighter than air, the vapors from a leak will initially hug the ground. Long term exposure to low concentrations or short term exposure to high concentrations may result in adverse health conditions from inhalation. Prolonged exposure of containers to fire or heat may result in their violent rupturing and rocketing. Ammonia is generally used as a fertilizer, a refrigerant, and in the manufacture of other chemicals.

Source: http://cameochemicals.noaa.gov/chemical/24008

For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the southwest was assumed. The target area was selected for three primary reasons: 1) the high volume of train and vehicle traffic, 2) the area is highly populated, and 3) proximity to several critical facilities. The geographic area covered in this analysis is depicted in Figure 4-12.

Figure 4-12: Location of Chemical Release

Analysis

The ALOHA atmospheric modeling parameters, depicted in Figure 4-13, were based upon a north-northwesterly wind speed of five miles per hour The temperature was 68°F with 75% humidity and partly cloudy skies.

The source of the chemical spill is a horizontal, cylindrical-shaped tank. The diameter of the tank was set to 8 feet and the length set to 33 feet with 12,408 gallons of ammonia. At the time of its release, it was estimated that the tank was 100% full. The ammonia in this tank is in a liquid state.

This release was based on a leak from a 2.5 inch-diameter hole, at the bottom of the tank.

Figure 4-13: ALOHA Plume Modeling Parameters

SITE DATA:
Location: BREESE, ILLINOIS
Building Air Exchanges Per Hour: 0.35 (sheltered single storied)
Time: June 2, 2009 1436 hours CDT (user specified)

CHEMICAL DATA:
Chemical Name: AMMONIA Molecular Weight: 17.03 g/mol
ERPG-1: 25 ppm ERPG-2: 150 ppm ERPG-3: 750 ppm
IDLH: 300 ppm LEL: 160000 ppm UEL: 250000 ppm
Ambient Boiling Point: -28.7° F
Vapor Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

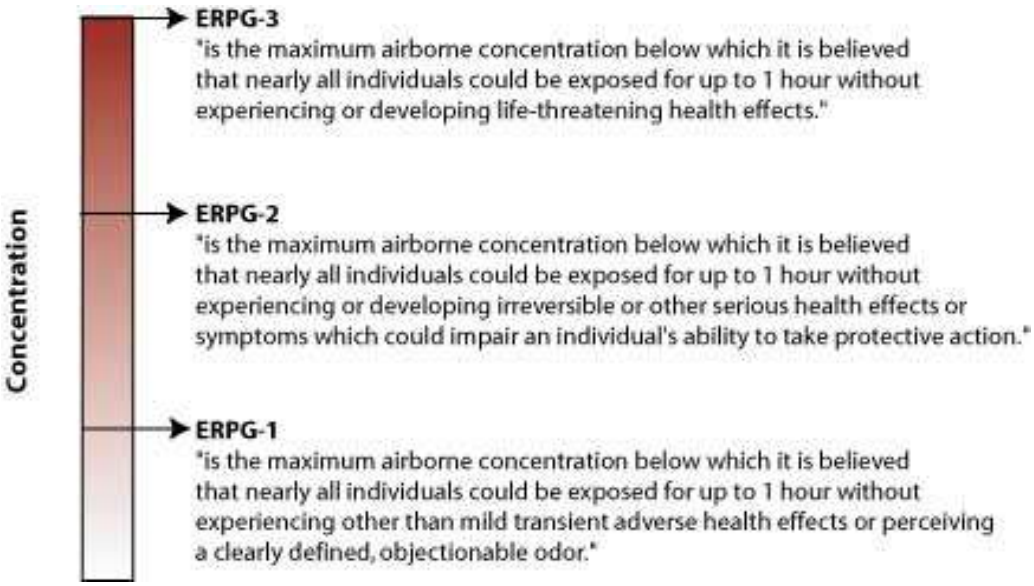
ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 5 miles/hour from SW at 10 feet
Ground Roughness: open country Cloud Cover: 5 tenths
Air Temperature: 68° F Stability Class: B
No Inversion Height Relative Humidity: 75%

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 8 feet Tank Length: 33 feet
Tank Volume: 12,408 gallons
Tank contains liquid Internal Temperature: 68° F
Chemical Mass in Tank: 31.6 tons Tank is 100% full
Circular Opening Diameter: 2.5 inches
Opening is 12 inches from tank bottom
Release Duration: 15 minutes
Max Average Sustained Release Rate: 7,740 pounds/min
(averaged over a minute or more)
Total Amount Released: 60,251 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

THREAT ZONE:
Model Run: Heavy Gas
Red : 1.4 miles --- (750 ppm = ERPG-3)
Orange: 3.2 miles --- (150 ppm = ERPG-2)
Yellow: greater than 6 miles --- (25 ppm = ERPG-1)

The Emergency Response Planning Guidelines (ERPGs) were developed by the ERPG committee of the American Industrial Hygiene Association. The ERPGs were developed as planning guidelines, to anticipate human adverse health effects caused by exposure to toxic chemicals. The ERPGs are three-tiered guidelines with one common denominator—a one-hour contact duration. Each guideline identifies the substance, its chemical and structural properties, animal toxicology data, human experience, existing exposure guidelines, the rationale behind the selected value, and a list of references. Figure 4-14 illustrates the ERPG three-tiered guidelines.

Figure 4-14: Three-Tiered ERPG Public Exposure Guidelines



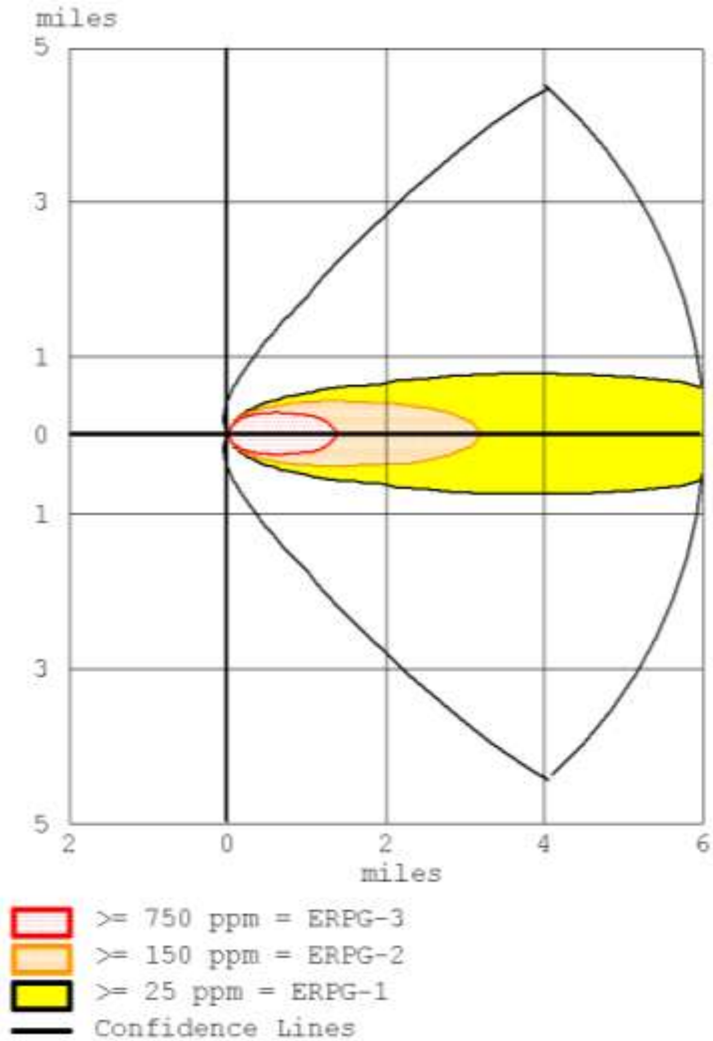
The definitions and format are from the ERPG publication.

The ERPG guidelines do not protect everyone. Hypersensitive individuals would suffer adverse reactions to concentrations far below those suggested in the guidelines. In addition, ERPGs, like other exposure guidelines, are based mostly on animal studies, thus raising the question of applicability to humans. The guidelines are focused on one period of time—one hour. Exposure in the field may be longer or shorter. However, the ERPG committee strongly advises against trying to extrapolate ERPG values to longer periods of time.

The most important point to remember about the ERPGs is that they do not contain safety factors usually incorporated into exposure guidelines such as the TLV. Rather, they estimate how the general public would react to chemical exposure. Just below the ERPG-1, for example, most people would detect the chemical and may experience temporary, mild effects. Just below the ERPG-3, on the other hand, it is estimated that the effects would be severe, although not life-threatening. The TLV differs in that it incorporates a safety factor into its guidelines, to prevent ill effects. The ERPG should serve as a planning tool, not a standard to protect the public.
Source: http://archive.orr.noaa.gov/cameo/locs/expguide.html

According to the ALOHA parameters, approximately 7,740 pounds per minute of material would be released per minute. The image in Figure 4-15 depicts the plume footprint generated by ALOHA.

Figure 4-15: Plume Footprint Generated by ALOHA

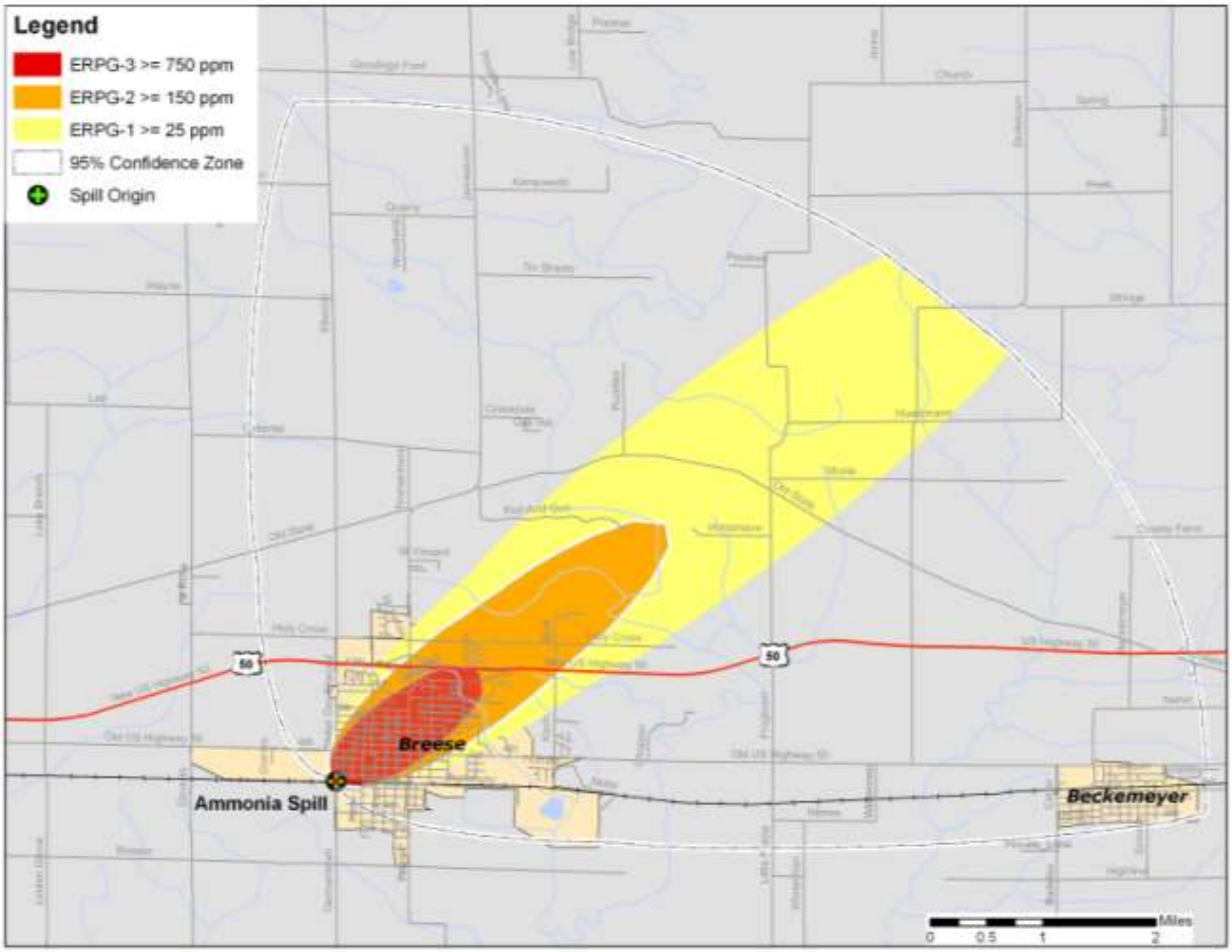


As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm). For the purpose of clarification, this report will designate each level of concentration as a specific zone. The zones are as follows:

- **Zone 1** (ERPG-3): The red buffer (≥750 ppm) extends no more than 1.4miles from the point of release after one hour.
- **Zone 2** (ERPG-2): The orange buffer (≥150 ppm) extends no more than 3.2 miles from the point of release after one hour.
- **Zone 3** (ERPG-1): The yellow buffer (≥25 ppm) extends more than six miles from the point of release after one hour.
- **Zone 4** (Confidence Lines): The dashed lines depict the level of confidence in which the exposure zones will be contained. The ALOHA model is 95% confident that the release will stay within this boundary.

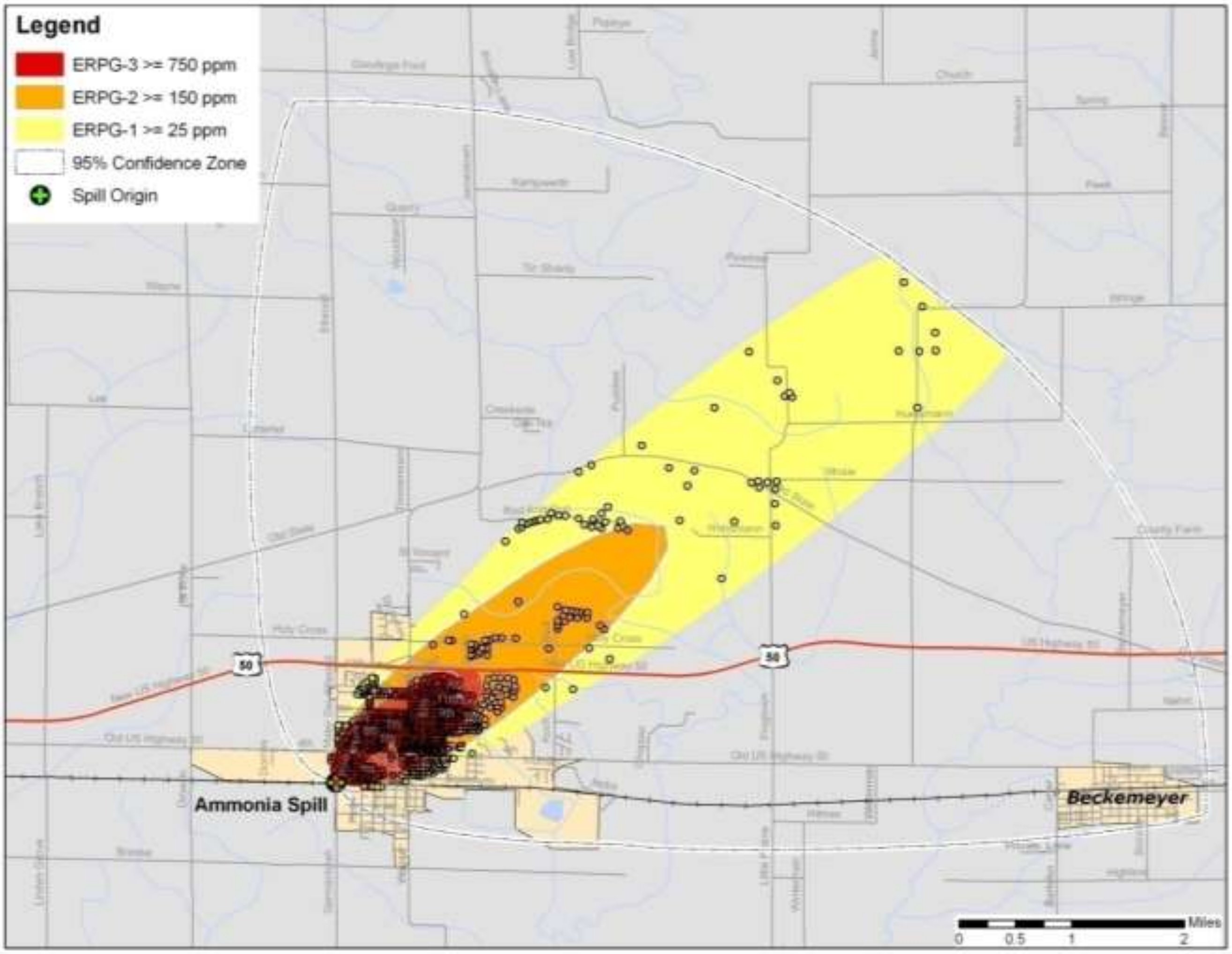
The image in Figure 4-16 depicts the plume footprint generated by ALOHA

Figure 4-16: ALOHA Plume Footprint Overlaid in ArcGIS



The Clinton County building inventory was added to ArcMap and overlaid with the plume footprint. The structure layer was then intersected with each of the three footprint areas to classify each point based upon the plume footprint in which it is located. Figure 4-17 depicts the Clinton County structures after the intersect process.

Figure 4-17: Clinton County Building Inventory Classified By Plume Footprint



Results

By summing the building inventory within all ERPG zones (ERPG-1: 25 ppm, ERPG-2: 150 ppm, and ERPG-3: 750 ppm), the GIS overlay analysis predicts that as many as 1,005 buildings could be exposed which have a replacement cost of approximately $193 million dollars. In addition 2,475 people could be affected.

Building Inventory Damage

The results of the analysis against known structure locations are depicted in Table 4-31. Table 4-32 includes the results of the analysis against the Clinton County Assessor Data.

Table 4-31: Number of Buildings Exposed

Occupancy	ERPG-1	ERPG-2	ERPG-3
Residential	135	226	630
Commercial	1	0	4
Industrial	0	0	0
Agricultural	0	0	0
Exempt*	0	1	2
Government*	0	0	3
Education*	0	2	1
Total	**136**	**229**	**640**

Table 4-32: Estimated Building Exposure Occupancy Type

Occupancy	Zone 1	Zone 2	Zone 3
Residential	$19,815,345	$48,318,120	$116,917,470
Commercial	$937,320	0	$3,151,620
Industrial	0	0	0
Agriculture	0	0	0
Exempt*	0	0	0
Government*	0	$2,500,000	0
Education*	0	$1,100,000	$555,000
Total	**$20,752,665**	**$51,918,120**	**$120,624,090**

* Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of building and building replacement costs for government, exempt, and non-profit may be underestimated.

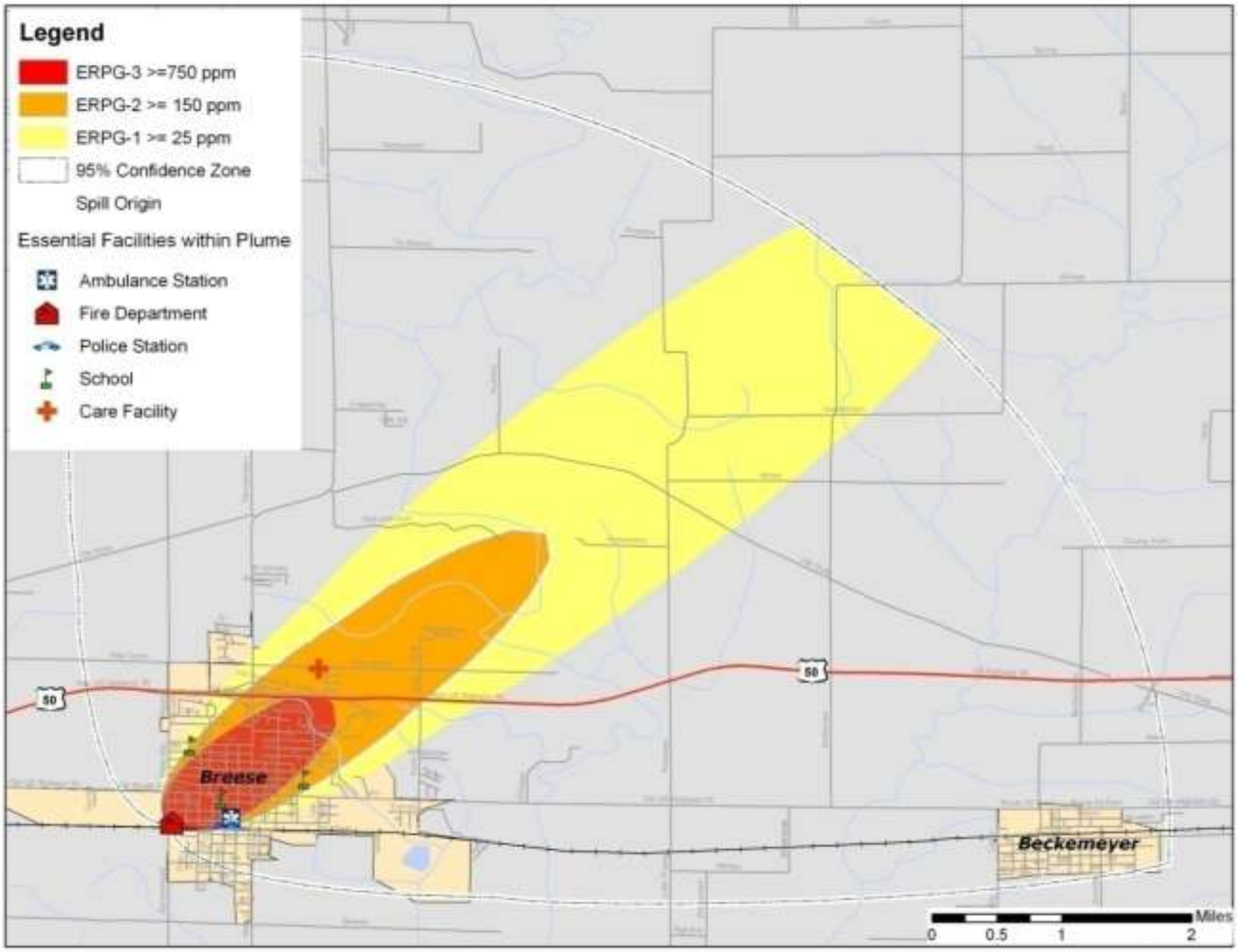
Essential Facilities Damage

There are one care facilities, one fire department, one ambulance service, one police department, and three schools within the limits of the chemical spill plume. These facilities are identified in Table 4-33. Their geographic locations are depicted in Figure 4-18.

Table 4-33: Essential Facilities within Plume Footprint

Name
Breese Fire Department
Breese Ambulance Service
Breese Police Department
St. Joseph's Hospital
All Saints Academy
Mater Dei Middle School
Breese Elementary School

Figure 4-18: Essential Facilities within Plume Footprint



Vulnerability to Future Assets/Infrastructure for Hazardous Materials Storage and Transport Hazard

A significant portion of Clinton County's population lives in close proximity to transportation corridors such as CSX Rail Line, Interstate 64, U.S. Route 50 and Illinois State Route 161. These areas are particularly vulnerable to chemical releases because of transportation of hazardous materials.

Analysis of Community Development Trends

Because of the concentration of Clinton County's Population to the transportation network, future development is likely to be vulnerable. The major transportation routes in Clinton County pose a threat of dangerous chemicals and hazardous materials release Clinton County will continue to provide a comprehensive means to mitigate, prepare for, respond to, and recover from hazards relating to hazardous materials releases.

4.4.7 Ground Failure Hazard

Subsidence

Subsidence in Illinois is a sinking of the land surface, usually associated with either underground mining or collapse of soil into crevices in underling soluble bedrock. Areas at risk for subsidence can be determined from detailed mapping of geologic conditions or detailed mine maps. Data sources were compiled from the Illinois Geologic Survey and Illinois Department of Natural Resources to assess the risk of subsidence in Clinton County. This section provides an overview of the subsidence hazards in Illinois in general and a discussion of the potential subsidence risk for Clinton County.

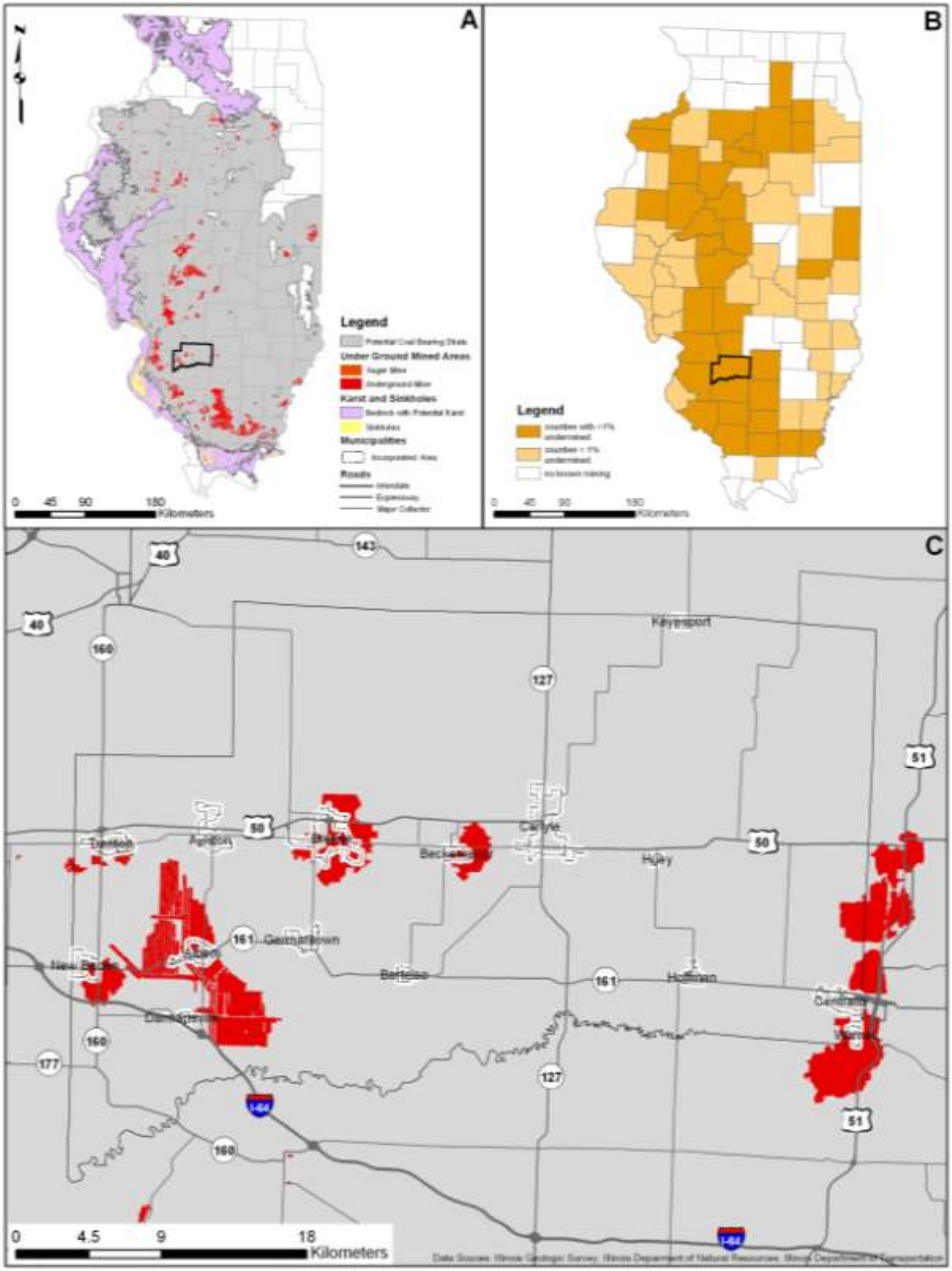
Underground Mining and Subsidence

Underground mines have been used extensively in Illinois to extract coal, lead, zinc, fluorites, shale, clay stones, limestone, and dolomite. When mining first began in Illinois, land over mined areas was sparsely populated. If the ground subsided, homes or other structures were seldom damaged. As towns and cities expanded over mined-out areas, subsidence damage to structures became increasingly more common. The most common underground mines in Illinois are coal mines. A recent study in Illinois has found that approximately 333,100 housing units were located over or adjacent to 839,000 acres mined for coal (Bauer, 2008).

Illinois has abundant coal resources. All or parts of 86 of 102 counties in the state have coal-bearing strata. As of 2007, approximately 1,050,400 acres (2.8% of the state) were mined. Of that total, 836,655 acres are underground mines (Bauer, 2008). Illinois ranks first among all U.S. states for reserves of bituminous coal (Illinois Coal Association, 1992).

Figure 4-19a shows the statewide distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines. Figure 4-19b shows the counties which are 0, < 1%, and >1% undermined; Figure 4-19c shows the countywide distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines.

Figures 4-19a, 4-19b, and 4-19c: Maps of Statewide and Countywide Areas with Subsidence Hazard Potential



Mining Methods

There are two fundamental underground mining methods used in Illinois: high-extraction methods, such as long-wall and low-extraction room, and pillar mining. High-extraction methods remove almost all of the coal in localized areas. For modern mining practices, subsidence associated with high-extraction methods is planned and regulated by state and federal authorities. The subsurface subsides above the mine within several days or weeks after the coal has been removed. Subsidence of the overburden above the mined-out area can continue up to seven years after subsurface removal, depending on the local geologic conditions (Bauer, 2008). The initial ground movements associated with this mining, which tend to be the largest, diminish rapidly after a few months. After subsidence has decreased to a level that no longer causes damage to structures, the land may be suitable for development. The maximum amount of subsidence is proportional to the amount of material extract and the depth between the mining and the surface. In general, over the centerline of the mine panel, subsidence can be 60% to 70% of the extract material (e.g., 10 ft of material extracted would cause a maximum subsidence of six to seven feet; Bauer, 2006).

For low-extraction techniques such as room-and-pillar mining, miners create openings (rooms) as they work. Enough of the coal layer is left behind in the pillars to support the ground surface. In Illinois, this system of mining extracts 40% to 55% of the coal resources in modern mines and up to 75% is some older mines. Based on current state regulations, room-and-pillar mines in operation after 1983 that do not include planned subsidence must show that they have a stable design. Although these permitting requirements have improved overall mine stability, there are no guarantees that subsidence will not occur above a room-and-pillar mine in the future. In general, if coal or other mined resources has been removed from an area, subsidence of the overlying material is always a possibility (Bauer, 2006).

Types of Mine Subsidence

In Illinois, subsidence of the land surface related to underground mining undertakes two forms: pit subsidence or trough (sag) subsidence. Pit subsidence structures are generally six to eight feet deep and range from two to 40 feet in diameter. Pit subsidence mostly occurs over shallow mines that are <100 feet deep where the overlying bedrock is <50 feet thick and composed of weak rock materials, such as shale. The pit is produced when the mine roof collapses and the roof fall void works its way to the surface. These structures form rapidly. If the bedrock is only a few feet thick and the surface materials are unconsolidated (loose), these materials may fall into adjacent mine voids, producing a surface hole deeper than the height of the collapse mine void. Pit subsidence can cause damage to a structure if it develops under the corner of a building, under a support post of a foundation, or in another critical location. Subsidence pits should be filled to ensure that people or animals do not fall into these structures (Bauer, 2006).

Trough subsidence forms a gentle depression over a broad area. Some trough subsidence may be as large as a whole mine panel (i.e. several hundred feet long and a few hundred feet wide). Several acres of land may be affected by a single trough event or feature. As previously discussed, the maximum vertical settlement is 60% to 70% of the height of material removed (e.g., two to six feet). Significant troughs may develop suddenly, within a few hours or days, or gradually over a period of years. Troughs originate over places in mines where pillars have collapsed, producing downward movement at the ground surface. These failures can develop over mines of any depth. Trough subsidence produces an orderly pattern of tensile features (tension cracks) surrounding a central area of possible compression features. The type and extent of damage to surface structures relates to their orientation and position within a trough. In the tension zone, the downward-bending movements that develop in the ground may damage buildings, roads, sewer and water pipes, and other utilities. The downward bending of the ground surface causes the soil to crack, forming the tension cracks that pull structures apart. In the relatively smaller compression zone, roads may buckle and foundation walls may be pushed inward. Buildings damaged by compressional forces typically need their foundations rebuilt and may also need to be leveled due to differential settling (Bauer, 2006).

Mine Subsidence Insurance

The Mine Subsidence Insurance Act of 1979 created subsidence insurance as part of an Illinois homeowner's policy. Homeowners in any of the Illinois counties undermined by approximately 1% or more automatically have mine subsidence insurance as a part of their policy, unless coverage is waived in writing. Mine subsidence insurance is especially important for homes located near or over mines that operated before the 1977 Surface Mine Control and Reclamation Act. The companies that operated these mines may no longer be in business (Bauer, 2006).

Mine Subsidence in Clinton County

All of Clinton County is underlain by rock units which potentially contain coal. Analysis of the GIS data layer of active and abandoned coal mines in Illinois obtained from the Illinois Department of Natural Resources (ILDNR) revealed that 26.3 mi^2 out of Clinton County's total 503.4 mi^2 (~ 5%) have been undermined. The undermined areas located between and along US 50 and Interstate 64. Towns potentially impacted by ground subsidence include Albers, Breeze, Beckemeyer, Centralia, Damiansville, Germantown, Trenton, and Wamac. Comparison of the GIS layer of buildings attained from Clinton County with ILDNR GIS layer of active and abandoned underground-coal mines was performed. This analysis revealed that 2,133 out of the 12,304 or ~17.3% of the buildings in the county were above undermined areas. The 2,133 structures located above underground mines have an estimate replacement cost of $23.3 million.

Subsidence Related to Karst Features

Subsidence can also occur on land located over soluble bedrock. The land over such bedrock often has topography characteristics of past subsidence events. This topography is termed "karst." Karst terrain has unique landforms and hydrology found only in these areas. Bedrock in karst areas are typically limestone, dolomite, or gypsum. In Illinois, limestone and dolomite (carbonate rocks) are the principle karst rock types; 9% of Illinois has carbonate rock types close enough to the ground surface to have a well-developed karst terrain. The area in Illinois in which the karst terrain is most developed is the southern and southwestern part of the state (Panno, et al., 1997).

Sinkhole Formation

The karst feature most associated with subsidence is the sinkhole. A sinkhole is an area of ground with no natural external surface drainage—when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes can vary from a few feet to hundreds of acres, and from less than one to more than 100 feet deep. Typically, sinkholes form slowly, so that little change is seen during a lifetime, but they also can form suddenly when a collapse occurs. Such a collapse can have a dramatic effect if it occurs in a populated setting.

Sinkholes form where rainwater moves through the soil and encounters soluble bedrock. The bedrock begins to dissolve along horizontal and vertical cracks and joints in the rock. Eventually, these cracks become large enough to start transporting small soil particles. As these small particles of soil are carried off, the surface of the soil above the conduit slump down gradually, and a small depression forms on the ground surface. This depression acts like a funnel and gathers more water, which makes the conduit still larger and washes more soil into it.

Sinkhole Collapse

Sudden collapse of a sinkhole occurs when the soil close to the ground surface does not initially slump down, but instead forms a bridge. Beneath that surface cover, a void forms where the soil continues to wash into the conduit. These voids are essentially shallow caves. Over time, the void enlarges enough that the weight of the overlying bridge can no longer be supported. The surface layer then suddenly collapses into the void, forming a sinkhole.

The process of forming a conduit and a soil bridge usually takes years to decades to form. However this natural process can be aggravated and expedited by human activates. Since the process of forming a sinkhole depends on water to carry soil particle down into the karst bedrock, anything that increases the amount of water flowing into the subsurface can accelerate sinkhole formation process. Parking lots, streets, altered drainage from construction, and roof drainage are a few of the things that can increase runoff.

Collapses are more frequent after intense rainstorms. However, drought and altering of the water table can also contribute to sinkhole collapse. Areas where the water table fluctuates or has suddenly been lowered are more susceptible to sinkhole collapse. It is also possible for construction activity to induce the collapse of near-surface voids or caves. In areas of karst bedrock, it is imperative that a proper geotechnical assessment be completed prior to construction of any significant structures. Solutions to foundation problems in karst terrain generally are expensive (White, 1988).

Sinkhole Subsidence or Collapse Potential for Clinton County

Clinton County is not underlain by any significant expanse of near-surface soluble bedrock (Figure 4-19c). Hence, subsidence related soluble bedrock is unlikely.

Hazard Extent for Subsidence

The extent of subsidence hazard in Clinton County is a function of where current development is located relative to areas of past and present underground mining.

Calculated Risk Priority Index for Ground Failure

Based on historical information, future ground failure in the affected regions of Clinton County is likely. According to the Clinton County planning team's RPI assessment, ground failure ranked as the number six highest hazard in the county.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude /Severity	=	RPI
3	x	1	=	3

Vulnerability Analysis for Ground Failure

The existing buildings and infrastructure of Clinton County are discussed in types and numbers in Table 4-9.

Critical Facilities

Any critical facility built above highly soluble bedrock could be vulnerable to land subsidence. A critical facility will encounter the same impacts as any other building within the affected area. These impacts include damages ranging from cosmetic to structural. Buildings may sustain minor cracks in walls due to a small amount of settling, while in more severe cases, the failure of building foundations can cause cracking of critical structural elements. Table 4-7 lists the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

Table 4-8 lists the building exposure in terms of types and numbers of buildings for the entire county. The buildings within this area can anticipate impacts similar to those discussed for critical facilities, ranging from cosmetic to structural. Buildings may sustain minor cracks in walls due to a small amount of settling, while in more severe cases, the failure of building foundations causes cracking of critical structural elements.

Infrastructure

Land subsidence areas within Clinton County could impact the roadways, utility lines/pipes, railroads, and bridges. The risk to these structures is primarily associated with land collapsing directly beneath them in a way that undermines their structural integrity. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (e.g. loss of power or gas to community); and railway failure from broken or impassable railways. In addition bridges could fail or become impassable causing risk to traffic.

Vulnerability to Future Assets/Infrastructure for Ground Failure

New buildings and infrastructure placed on undermined land or on highly soluble bedrock will be vulnerable to ground failure.

Analysis of Community Development Trends

Abandoned underground mine subsidence may affect several locations within the county; therefore buildings and infrastructure are vulnerable to subsidence. Continued development will occur in many of these areas. Currently, Clinton County reviews new development for compliance with the local zoning ordinance. Newly planned construction should be reviewed with the historical mining maps to minimize potential subsidence structural damage.

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Section 5 - Mitigation Strategy

The goal of mitigation is to reduce a hazard's future impacts including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. The goal of mitigation is to build disaster-resistant communities. Mitigation actions and projects should be based on a well-constructed risk assessment; Clinton County's is provided in Section 4 of this plan. Mitigation should be an ongoing process that adapts over time to accommodate the community's needs.

5.1 Community Capability Assessment

The capability assessment identifies current activities used to mitigate hazards. The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to the lessening of disaster damages. The assessment also provides an evaluation of these capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within all of the communities listed in Section 2 of this plan.

5.1.1 National Flood Insurance Program (NFIP)

The county and most of its communities are members of the NFIP. The following communities choose not to participate in the program: Aviston, Bartelso, Damiansville, and Wamac. Huey does not participate because it is not located in a flood hazard boundary. HAZUS-MH estimates that approximately 608 households were located in the Clinton County Special Flood Hazard Area; as of June 18, 2007, the Federal Emergency Services Disaster Agency NFIP Insurance Report for Illinois stated that 94 households paid flood insurance, insuring $11,628,200 in property value. The total premiums collect amounted to $50,592 which on average was $1,745 annually. From 1978 to 2007, 13 claims were filed; totaling $83,077. The average claim was $6,391.

The county and incorporated areas do not participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community meeting the three goals of the CRS: 1) reduce flood losses; 2) facilitate accurate insurance rating; and 3) promote the awareness of flood insurance. Table 5-1 identifies each community and the date each participant joined the NFIP.

Table 5-1: Additional Information on Communities Participating in the NFIP

Community	Participation Date	FIRM Date	CRS Date	CRS Rating	Flood Plain Zoning Ordinance Adopted Last
Clinton County	12/20/74	05/01/87	N/A	N/A	8/2/2007
Albers	03/22/74	10/05/84	N/A	N/A	8/2/2007
Aviston	N/A	N/A	N/A	N/A	N/A
Bartelso	N/A	N/A	N/A	N/A	N/A
Beckemeyer	06/02/04	NSFHA	N/A	N/A	4/9/2007
Breese	06/07/74	02/06/84	N/A	N/A	8/2/2007

Community	Participation Date	FIRM Date	CRS Date	CRS Rating	Flood Plain Zoning Ordinance Adopted Last
Carlyle	12/07/73	09/04/85	N/A	N/A	8/2/2007
Centralia	05/03/74	12/18/84	N/A	N/A	8/2/2007
Damiansville	N/A	N/A	N/A	N/A	N/A
Germantown	03/29/74	07/20/84	N/A	N/A	8/2/2007
Hoffman	06/02/04	NSFHA	N/A	N/A	9/12/2007
Huey	N/A	N/A	N/A	N/A	N/A
New Baden	05/24/74	09/04/86	N/A	N/A	8/2/2007
Trenton	06/02/04	NSFHA	N/A	N/A	8/2/2007

The Village of Huey has no identified flood hazard boundaries; therefore, the communities do not participate in the NFIP. The Villages of Aviston, Bartelos, and Damiansville do have indentified flood zones but, have previously chosen not to participate in the program due lack of interest or perceived need. The County will continue to educate these jurisdictions on the benefits of the program.

5.1.2 Stormwater Management Stream Maintenance Ordinance

Clinton County nor its cities or villages have a storm water management plan or ordinances.

5.1.3 Zoning Management and Subdivision Control Ordinance

Clinton County and several of its cities and villages have land use planning or zoning ordinances. Clinton County also has a subdivision control ordinance which defines what a subdivision is within the County and places standards on subdivision roads. This ordinance was passed September 16th 1991 and covers all unincorporated areas within the County.

5.1.4 Erosion Management Program/ Policy

Clinton County utilizes the Illinois Administrative Code Title 35 and the Illinois Environmental Protection Act, administered by the Illinois Environmental Protection Agency. This requires the submission of a stormwater pollution prevention plan (SWPPP) for projects involving more than one acre of land disturbance.

5.1.5 Fire Insurance Rating Programs/ Policy

Table 5-2 lists the fire departments in Clinton County, as well as the ISO rating and the number of members in each department.

Table 5-2: Listing of Fire Departments, Ratings, and Number of Firefighters

Fire Department	Coverage Area	Fire Insurance Rating	Chief
Clin-Clair Fire Protection District	Albers/New Baden/ Damiansville/Looking Glass Township	ISO 6/9	Chief: Rick Musenbrock
Aviston Fire Protection District Aviston FD	Village of Aviston and eastern part of Sugar Creek Township Village of Aviston	ISO 7/9 ISO 7	Chief: Allan Billhartz
Bartelso - Santa Fe Fire Protection District	Village of Bartelso and Santa Fe Township	ISO 6 Rural 8b/10	Chief: Marcel Winkler
Beckemeyer	Village of Beckemeyer	ISO 5	
Beckemeyer-Wade Township Fire Protection District	Beckemeyer/Wade Township	ISO City -5 Rural – 8	30 Volunteers Chief: Kenneth Bromley
Breese Volunteer Fire Prot District	City of Breese and 25 square miles surrounding	ISO City - 5 Rural 9	34 Volunteers Chief: Robert Wuest
Carlyle Fire Protection District	City of Carlyle – Carlyle Township	ISO City–5 Rural -9	Chief: Robert Mahlandt
Centralia Fire Department Centralia FPD	City of Centralia	ISO City 3 ISO 4/9	Chief Mike Kracht
Germantown Rural Fire Protection District		ISO 6/9	Chief: Jeffry Johnson
Hoffman Fire Protection District		ISO City – 7 Rural - 9	Chief: Dennis Haake
Huey-Ferrin-Boulder Fire Protection District		ISO Village 6 Rural 9	Chief:Sylvester Revermann
Keyesport Fire Protection District		ISO Village – 6 Rural - 9	Chief: Duane Wiegmann
New Baden Volunteer Fire Protection District	New Baden and western parts of Clin-Clair FPD	ISO 6	Chief: Randy Moss
Saint Rose Fire Protection District		ISO Village 6 Rural 10	Chief: Dan Trame
	Bartelso and Santa Fe Township	ISO 9/10	Chief: Daniel Gilbreth
Sugar Creek Fire Protection District	Trenton/Sugar Creek Township and part of Lebanon Township in St. Clair County	ISO 5/9	26 Volunteers Chief: Gary Schwend
Trenton		ISO 5	
Wheatfield Township Fire Protection District		ISO 9/10	Chief: Donald Beckemeyer

Sources: Illinois State Fire Marshall, http://fdmail.sfm.illinois.gov/pdf/R_FD_County_Short.pdf Accessed 6/29/09

5.1.6 Land Use Plans

Clinton has a Land Use Plan adopted in 2001, and the communities of Albers, Aviston, Breese, Carlyle, Centralia, and Trenton have also adopted Comprehensive Plans that include a land use plan. Many communities have adopted zoning and subdivision ordinances, and Clinton County has adopted zoning and subdivision regulations that govern the unincorporated areas and the municipalities that do not have their own land use regulations.

5.1.7 Building Codes

Clinton County has not adopted a building code, but many of the incorporated communities have adopted the National Building Code and use the Illinois Capital Development Board's Building Codes as their guide for public building standards.

5.2 Mitigation goals

The Clinton County Emergency Services Disaster Agency, Southern Illinois University-Carbondale Geology Department, the Polis Group of IUPUI, and the Southwestern Illinois Regional and Metropolitan Regional Planning Commission assisted the Clinton County Multi-Hazard Mitigation Planning Team in the formulation of mitigation strategies and projects for Clinton County. The goals and objectives set forth were derived through participation and discussion of the views and concerns of the Clinton County Multi-Hazard Mitigation Team members and related public input. The MHMP will focus on these goals, with a great deal of public input, to ensure that the priorities of the communities are represented.

The goals represent long-term, broad visions of the overall vision the county would like to achieve for mitigation. The objectives are strategies and steps which will assist the communities to attain the listed goals. Table 5-5 lists mitigation actions, which are defined projects that will help to complete the defined goals and objectives.

Goal 1: Lessen the impacts of hazards to new and existing infrastructure

(a) Objective: Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.

(b) Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.

(c) Objective: Minimize the amount of infrastructure exposed to hazards.

(d) Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.

(e) Objective: Improve emergency sheltering in Clinton County.

Goal 2: Create new or revise existing plans/maps for Clinton County

(a) Objective: Support compliance with the NFIP for each jurisdiction in Clinton County.

(b) Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.

(c) Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.

Goal 3: Develop long-term strategies to educate Clinton County residents on the hazards affecting their county

(a) Objective: Raise public awareness on hazard mitigation.

(b) Objective: Improve education and training of emergency personnel and public officials.

5.3 Mitigation Actions/Projects

Upon completion of the risk assessment and development of the goals and objectives, the Planning Committee was provided with a list of the six mitigation measure categories from the *FEMA State and Local Mitigation Planning How to Guides*. The measures are listed as follows.

- **Prevention:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.

- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.

- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.

- **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

After Meeting #3, held June 23, 2009 MHMP members were presented with the task of individually listing potential mitigation activities using the FEMA evaluation criteria. The MHMP members brought their mitigation ideas to Meeting #4, which was held September 2, 2009. The evaluation criteria (STAPLE+E) involved the following categories and questions.

Social:
- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

Technical:
- How effective is the action in avoiding or reducing future losses?
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?
- Does the mitigation strategy address continued compliance with the NFIP?

Administrative:
- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

Political:
- Is there political support to implement and maintain this action?
- Is there a local champion willing to help see the action to completion?
- Is there enough public support to ensure the success of the action?
- How can the mitigation objectives be accomplished at the lowest cost to the public?

Legal:
- Does the community have the authority to implement the proposed action?
- Are the proper laws, ordinances, and resolution in place to implement the action?
- Are there any potential legal consequences?
- Is there any potential community liability?
- Is the action likely to be challenged by those who may be negatively affected?
- Does the mitigation strategy address continued compliance with the NFIP?

Economic:

- Are there currently sources of funds that can be used to implement the action?
- What benefits will the action provide?
- Does the cost seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action contribute to other community economic goals such as capital improvements or economic development?
- What proposed actions should be considered but be "tabled" for implementation until outside sources of funding are available?

Environmental:

- How will this action affect the environment (land, water, endangered species)?
- Will this action comply with local, state, and federal environmental laws and regulations?
- Is the action consistent with community environmental goals?

The development of the MHMP is the first step in a multi-step process to implement projects and policies to mitigate hazards in the county and its communities.

5.3.1 Completed or Current Mitigation Actions/Projects

Since this is the first mitigation plan developed for Clinton County, there are no deleted or deferred mitigation items. The following tables will refer to completed, ongoing, or future mitigation actions. Table 5-3 presents the completed and ongoing mitigation actions and projects in the county.

Table 5-3: Completed or Current Mitigation Actions

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Implement Nixle for mass media release via e-mail and text messages	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	The county and its incorporated jurisdictions have implemented this project.
Establish Global Connect for emergency notification	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective: S**trengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Trenton	The county has implemented this project.
Establish Storm Ready Communities	**Goal:** Develop long-term strategies to educate Clinton County residents on the hazards affecting their county **Objective:** Raise public awareness on hazard mitigation.	Flood, Tornado, Thunderstorm	Trenton, Centralia	This project was successfully completed.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Implement Reverse 911	**Goal:** Lessen the impacts of hazards to individuals and infrastructure **Objective: S**trengthen the communication between emergency management and the public.	Tornado, Flood, Thunderstorm, Winter Storm	Aviston	The community has implemented this project.
Purchase weather radios for schools, community center, and nursing home	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Equip public facilities and communities to notify large or at risk groups of immanent severe weather so appropriate measures to protect their populations can be taken.	Flood, Tornado, Thunderstorm, Winter Storm	Trenton	The community has implemented this project.
Complete a CEMP	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County	The county completed this project.
Establish a tie-down ordinance for mobile home safety	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Tornado	Clinton County	The county completed this project.
Establish mutual aid agreements: MABUS, ILEAS	**Goal:** Lessen the impacts of incident /disasters to individuals and infrastructure **Objective:** Provide communities with the trained responders and equipment to respond to natural and technological incidents/disasters.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County	The county completed this project.
Establish a generator agreement	**Goal:** Lessen the impacts of incident /disasters to individuals and infrastructure **Objective:** Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Winter Storm	Trenton	The community has implemented this project.
Develop a countywide emergency route	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Winter Storm	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	The county completed this project.
Establish an LEPC agreement with Washington County, Illinois	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Hazmat	Clinton County	The county completed this project.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Establish a hazmat mutual assistance agreement with St. Clair County	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Hazmat	Clinton County	The county completed this project.
Set up hazmat training exercises with Washington County	**Goal:** Develop long-term strategies to educate Clinton County residents on the hazards affecting their county **Objective:** Improve education and training of emergency personnel and public officials	Hazmat	Clinton County	The county completed this project.

5.4 Implementation Strategy and Analysis of Mitigation Projects

Implementation of the mitigation plan is critical to the overall success of the mitigation planning process. The first step is to decide based upon many factors, which action will be undertaken initially. In order to pursue the top priority first, an analysis and prioritization of the actions is important. Some actions may occur before the top priority due to financial, engineering, environmental, permission, and/or site control issues. Public awareness and input of these mitigation actions can increase knowledge to capitalize on funding opportunities and monitoring the progress of an action.

In Meeting #4, the planning team prioritized mitigation actions based on a number of factors. A rating of High, Medium, or Low was assessed for each mitigation item and is listed next to each item in Table 5-5. The factors were the STAPLE+E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria listed in Table 5-4.

Table 5-4: STAPLE+E planning factors

S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E – Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, comply with federal, state, and local environmental regulations, and are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

For each mitigation action related to infrastructure, new and existing infrastructure was considered. Additionally, the mitigation strategies address continued compliance with the NFIP. While an official cost benefit review was not conducted for any of the mitigation actions, the estimated costs were discussed. The overall benefits were considered when prioritizing mitigation items from High to Low. An official cost benefit review will be conducted prior to the implementation of any mitigation actions. Table 5-5 presents mitigation projects developed by the planning team.

Table 5-5: Mitigation Strategies

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Purchase additional sirens throughout the county as an early warning system	**Goal:** Lessen the impacts of incident s/disasters to individuals and infrastructure **Objective:** Evaluate and strengthen the communication abilities of emergency services throughout the county.	Tornado, Thunderstorm	Clinton County	High	The county's existing sirens are not sufficient. Funding has not been secured as of 2009, but the PDM program and community grants are an option. If funding is available, implementation will begin within one year.
Procure transfer switches for generators in critical facilities	**Goal:** Lessen the impacts of incident s/disasters to individuals and infrastructure **Objective:** Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.	Winter Storm	Clinton County	High	The county ESDA will oversee implementation of this project. Funding has not been secured as of 2009, but the PDM program and community grants are an option. If funding is available, implementation will begin within one year.
Conduct engineering study to assess the safety of critical facilities	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Flood, Tornado, Earthquake, Thunderstorm, Winter Storm, Subsidence	Clinton County	High	The ESDA director with assistance from the county engineer will oversee this project and will work with an engineering firm. The county will seek a planning grant from community improvement programs. If funding is available, implementation will begin within one year.
Institute a buy-out plan for a senior citizen home in Trenton	**Goal:** Lessen the impacts of flooding to individuals and infrastructure. **Objective:** Support compliance with the NFIP for each jurisdiction in Clinton County.	Flood	Trenton	High	The County ESDA director and County Floodplain Manger will oversee the implementation of the project. Funding has not been secured as of 2009 but will be sought from funding sources such as IEMA and FEMA. Implementation, if funding is available, is forecasted to begin within one year.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Develop a public education program to explain hazard communications, emergency plans, and generator safety	**Goal:** Develop long-term strategies to educate Clinton County residents on the hazards affecting their county **Objective:** Raise public awareness on hazard mitigation.	Flood, Tornado, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	Medium	The county ESDA director will oversee this project. Local resources, such as railroad/train companies and schools, will be used to develop educational literature and present to each jurisdiction at public events or in schools. If resources are available, the project will be implemented within three years
Improve drainage in along important transportation routes in the county: Old Route 50 in Trenton, State Route 50 and 160 in Trenton, State Route 50 and Germantown Road in Breeze, State Route 161 west side of Centralia, City of Centralia along railroad line	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Minimize the amount of infrastructure exposed to hazards.	Flood	Clinton County, Trenton, Breeze, Centralia	Medium	The ESDA director with assistance from the county engineer will work with ILDOT and IDNR to evaluate the current conditions of the county's waterways and drainage and develop a plan. Funding has not been secured as of 2009, but county, state, and federal funding will be sought. Implementation will begin within three years.
Improve railroad crossings	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Improve conditions at railroad crossings to reduce the risk of accidents and potential hazardous material releases.	Hazmat	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	Medium	The county ESDA director and LEPC will oversee this project. Local resources, e.g. rail companies, will be used to implement this project, and funding will be sought from local resources and community grants. If funding and resources are available, the project will begin within three years.
Install inertial valves at critical facilities	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.	Earthquake	Clinton County	Medium	The county ESDA director will oversee implementation of this project. Funding has not been secured as of 2009, but the PDM program and community grants are an option. If funding is available, implementation will begin within three years.
Create a Web-based distributive GIS to disseminate data to local communities	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** To efficiently distribute information between jurisdictions to aid in hazard and other community planning	Flood, Tornado, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County	Medium	The ESDA director will work with County's GIS coordinator and local resources to research training and implementation opportunities. The county may request funding for training from community resources grants. If funding is available, implementation will begin within three years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Establish safe rooms in key locations within the county, e.g. mobile parks, schools, community centers	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Improve emergency sheltering in Clinton County.	Tornado, Thunderstorm	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	Medium	The ESDA director will work with local shelters, schools, healthcare facilities, and first responders to identify locations to establish safe rooms. The county may opt to conduct an engineering study to determine best locations. The PDM program or local resources are funding options. If funding is available, implementation will begin within three years.
Create maps of undermined areas in the county	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Subsidence	Clinton County	Low	The county ESDA director, county engineer, or GIS coordinator will oversee this project. The county will seek assistance from IDNR. If funding is available, implementation will begin within five years.
Purchase signage for roads that flood frequently	**Goal:** Lessen the impacts of incidents /disasters to individuals and property **Objective:** Communication of the hazard to individuals in order to eliminate deaths, injuries, and damage to property.	Flood	Clinton County	Low	The ESDA director and/or county engineer will oversee this project and will seek funding from resources such as ILDOT or the PDM program. If funding is available, implementation will begin within five years.
Conduct a sewer upgrade to separate stormwater and sanitary sewer lines	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Minimize the amount of infrastructure exposed to hazards.	Flood	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	Low	The ESDA director and county or town engineer will work with ILDOT and IDNR to evaluate the current conditions of the community's sewer system and develop a plan. Funding has not been secured as of 2009, but county, state, and federal funding will be sought. Implementation will begin within low years.
Construct or identify a new shelter	**Goal:** Lessen the impacts of severe weather to individuals and property **Objective:** Improve emergency sheltering in Clinton County.	Tornado, Thunderstorm	Trenton, Clinton County	Low	The ESDA director will work with American Red Cross to establish the shelter. The PDM program or local resources are funding options. If funding is available, implementation will begin within five years.
Develop alternative methods of fueling for natural gas generators	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Earthquake	Clinton County	Low	The EDS director will oversee this project. The county will seek help and potential funding from IEMA or FEMA to implement the study. If funding is available, implementation will begin within five years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Create a railroad inventory/database to improve communication with rail companies	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Hazmat	Clinton County	Low	The ESDA director will work with local rail companies to implement this project. Local resources will be used to create and maintain the database. If resources are available, implementation will begin within five years.
Improve and enforce building codes and seismic standards	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Earthquake	Clinton County	Low	The ESDA director and county engineer will work with the local planning commission to review building code standards. The MHMP planning committee will review and revise codes as necessary. If local resources are available, implementation of this project will begin within five years.

The Clinton County Emergency Services Disaster Agency will be the local champions for the mitigation actions. The county commissioners and the city and town councils will be an integral part of the implementation process. Federal and state assistance will be necessary for a number of the identified actions. Southwestern Illinois Planning Commission is qualified to provide technical grant writing services to assist the county in seeking resources to achieve the recommended mitigation action.

5.5 Multi-Jurisdictional Mitigation Strategy

As a part of the multi-hazard mitigation planning requirements, at least two identifiable mitigation action items have been addressed for each hazard listed in the risk assessment and for each jurisdiction covered under this plan.

Each of the 14 jurisdictions, including Clinton County, were invited to participate in brainstorming sessions in which goals, objectives, and strategies were discussed and prioritized. Each participant in these sessions was armed with possible mitigation goals and strategies provided by FEMA, as well as information about mitigation projects discussed in neighboring communities and counties. All potential strategies and goals that arose through this process are included in this plan. The county planning team used FEMA's evaluation criteria to gauge the priority of all items. A final draft of the disaster mitigation plan was presented to all members to allow for final edits and approval of the priorities.

Section 6 - Plan Maintenance

6.1 Monitoring, Evaluating, and Updating the Plan

Throughout the five-year planning cycle, the Clinton County Emergency Service and Disaster Director will reconvene the MHMP planning committee to monitor, evaluate, and update the plan on an annual basis. Additionally, a meeting will be held during March 2015 to address the five-year update of this plan. Members of the planning committee are readily available to engage in email correspondence between annual meetings. If the need for a special meeting arises, due to new developments or a declared disaster, the team will meet as necessary to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

The committee will review the county goals and objectives to determine their relevance to changing situations in the county. In addition, state and federal policies will be reviewed to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects and will include which implementation processes worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies should be revised.

Updates or modifications to the MHMP during the five-year planning process will require a public notice and a meeting prior to submitting revisions to the individual jurisdictions for approval. The plan will be updated via written changes, submissions as the committee deems appropriate and necessary, and as approved by the county commissioners.

The GIS data used to prepare the plan was obtained from existing county GIS data as well as data collected as part of the planning process. This updated HAZUS-MH GIS data has been returned to the county for use and maintenance in the county's system. As newer data becomes available, this updated data will be used for future risk assessments and vulnerability analyses.

6.2 Implementation through Existing Programs

The results of this plan will be incorporated into ongoing planning efforts. Many of the mitigation projects identified as part of this planning process are ongoing. Where needed, modifications will be made to the county and community planning documents and ordinances as part of regular updates. The mitigation plan will be used to help guide building code changes and land use planning.

6.3 Continued Public Involvement

Continued public involvement is critical to the successful implementation of the MHMP. Comments from the public on the MHMP will be received by Clinton County Emergency Management Director and forwarded to the MHMP planning committee for discussion. Education efforts for hazard mitigation will be ongoing through the local television stations, brochures, and yearly public meetings. Once adopted, a copy of this plan will be posted in the library and on the county website.

Glossary of Terms

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A

AEGL – Acute Exposure Guideline Levels
ALOHA – Areal Locations of Hazardous Atmospheres

B

BFE – Base Flood Elevation

C

CAMEO – Computer-Aided Management of Emergency Operations
CEMA – County Emergency Services Disaster Agency
CEMP – Comprehensive Emergency Management Plan
CERI – Center for Earthquake Research and Information
CRS – Community Rating System

D

DEM – Digital Elevation Model
DFIRM – Digital Flood Insurance Rate Map
DMA – Disaster Mitigation Act

E

EAP – Emergency Action Plan
ERPG – Emergency Response Planning Guidelines
EMA – Emergency Services Disaster Agency
EPA – Environmental Protection Agency
ESDA - Emergency and Disaster Services

F

FEMA – Federal Emergency Services Disaster Agency
FIRM – Flood Insurance Rate Maps
FIS – Flood Information Study

G

GIS – Geographic Information System

H

HAZUS-MH – **Ha**zards **US**A **M**ulti-**H**azard
HUC – Hydrologic Unit Code

I

IDNR – Illinois Department of Natural Resources
IEMA – Illinois Emergency Services Disaster Agency

L

LEPC - Local Emergency Planning Committee

M

MHMP – Multi-Hazard Mitigation Plan

N

NCDC – National Climatic Data Center
NEHRP – National Earthquake Hazards Reduction Program
NFIP – National Flood Insurance Program
NOAA – National Oceanic and Atmospheric Administration

P

PPM – Parts Per Million

R

RPI – Risk Priority Index

S

SPC – Storm Prediction Center
SWPPP – Stormwater Pollution Prevention Plan

SIUC - Southern Illinois University, Carbondale

T

TEEL - Temporary Emergency Exposure Limit

U

USGS – United States Geological Survey

Appendices

Appendix A – Minutes of the Multi-Hazard Mitigation Planning Team Meetings

Pre-Disaster Mitigation Plan Minutes

Planning Program Oversight Meeting:
County Board Chairs, Emergency Services & Disaster Agency Coordinators, Southwestern Illinois Metropolitan and Regional Area Planning Commission, SIUC Geology Department, and IUPUI-Polis

Meeting Date: Tuesday, April 29, 2008

Meeting Time: 1 hour 30 minutes

Place: Clinton County Courthouse Boardroom

Attendance:

Dave Coats, POLIS
John Buechler, POLIS
Nicholas Pinter, SIUC Geology
Andy Flor, SIUC Geology
Jonathan Remo SIUC Geology
Kevin Terveer, Southwestern Ill Metro and Regional Area Planning Commission (SIMAPC)
Linda Tragesser, Southwestern Ill Metro and Regional Area Planning Commission (SIMAPC)
Jill Franks, Bond County Board Chair
Ray Kloeckner, Clinton County Board Chairman
Allan Davis, Bond County ESDA
Richard Crocker, Clinton County ESDA

The meeting was called to order.

Dave Coats (associate director) and John Buechler (project manager) from IUPUI, Polis Center explained the Pre-Disaster Mitigation Planning Project. It was explained that FEMA, based on Federal legislation passed in 2000, required that all incorporated communities must have a Pre-Disaster Mitigation Plan in place to be eligible for FEMA mitigation funding. They also explained that a 25% match was needed to receive funding. John Buechler stated that the value of the GIS data and sweat equity that will be put into developing this plan would satisfy the match. He also expresses the importance of tracking and documenting the time spent on the project by each volunteer working on the project.

Dave Coats and John Buechler explained the process for developing the plan and that it will require a total of six meetings in each of the counties. They went into great detail about each of the meeting and the issues that would be addressed. They also estimated that the complete process of developing the plan would take about one year. Lastly, they introduced a website that the planning team will use to organize meeting, post documents, and to access minutes throughout the planning process.

Dr. Nicholas Pinter (SIUC Geology) introduced the team and explained the role that SIUC will play in planning process. SIUC will be providing all the technical mapping throughout the planning process.

There was a general discussion about the agreement that will need to be made about the restricted use of the GIS data needed for the project. Andy Flor, Nicholas Pinter, Dave Coats, and John Buechler all confirmed that a Memorandum of Understanding would be created and sent to each county for review and acceptance. All the County Board Chairmen expressed their concerns with the discretion of the use of the GIS data asked how the planning team would be selected. Dave Coats responded and said that a list of affiliations is provided for ideal team member candidacy. He explained that the Emergency Management Agency is typically selected as the chair of the planning team. Lastly, he mentioned that the planning team must be officially recognized by the County Board.

A brief overview of the pre-disaster mitigation planning process was outlined by John Buechler, Dave Coats, and Nicholas Pinter. Clinton County representatives expressed the necessity of the plan and are highly motivated in completing the plan.

The first meeting will be scheduled once the Memorandum of Understanding is completed and data for the plan is available. The location will be at the Clinton County Court House in the Board Room.

The County's assessment data (Parcel Maps, Tax Assessment Database, and Ortho Aerial Photography) will be provided to SIUC Geology Planning Team to complete the technical mapping for meeting one.

The composition of the County Multi-Hazard Mitigation Planning Team was discussed. Several names, and those with professional expertise, were suggested to round out the planning team. A complete list of planning members will be developed and posted before the first meeting.

Meeting was adjourned.

CLINTON COUNTY MEMORANDUM OF UNDERSTANDING (MOU)

IEMA
Illinois Emergency Management Agency

Rod R. Blagojevich, Governor
Andrew Velasquez III, Director

March 5, 2008

Ray Kloeckner, Chairman
Clinton County Board
4626 Court Road
Germantown, IL 62245

Dear Mr. Kloeckner:

The Southwestern Illinois Metropolitan and Regional Planning Commission, Southern Illinois University Carbondale, and the Polis Center IUPUI are assisting Clinton County with developing a Pre-Disaster Mitigation Plan. This study involves analyzing losses for buildings in the event of an earthquake, flood, or any other disaster. Your county is providing modeling data as a match for federal grant dollars. To analyze property at risk, we require the following information from your tax assessment system.

- Building Improvement value
- Land Improvement value
- Construction type (wood, etc.)
- Property Use
- Total square footage
- Basement square footage
- Property address
- Property City

In addition, Southern Illinois University Carbondale and the Polis Center require existing mapping information to accurately map the losses. This includes roads, parcels, and addresses. As part of the analysis, we will prepare data on the county's essential facilities and provide this back to the county for its future use.

Your cooperation in this data sharing and pre-disaster mitigation planning process will reduce loss of life and property damage resulting from a potential disaster. Please provide your written approval to Illinois Emergency Management Agency with a copy to Southern Illinois University Carbondale.

Sincerely

Ron Davis
State Hazard Mitigation Officer

Ray Kloeckner, Chairman
Clinton County Board

EMAP Accredited

1035 Outer Park Drive • Springfield, Illinois • 62704 • Telephone (217) 785-9900 • http://www.iema.illinois.gov

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COUNTY OF CLINTON
Office of County GIS Coordinator

P.O. Box 53 • 850 Fairfax Street • Room 124 • Carlyle, IL 62231

Jay Donnelly

[618] 594-8571
Fax [618] 594-8599

July 23, 2008

Ron Davis
State Hazard Mitigation Officer
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Dear Mr. Davis:

Clinton County is in receipt of your letter to Ray Kloeckner, Clinton County Board Chairman, regarding data sharing for the Pre-Disaster Mitigation Plan. Mr. Kloeckner asked me to convey to you our County's intent to share the requested data with the Illinois Emergency Management Agency, Southern Illinois University – Carbondale, and the Southwestern Illinois Planning Commission. Your request has been forwarded to our database vendor, Manatron, for review and compliance. They will attempt to meet as much of the request as possible. However, some of the data you have requested is data that is not collected and maintained in our database. We will forward you the data after it is exported by Manatron. We need to know the format you require for this data. Our default format is Microsoft Access, but we require confirmation from you that this is an acceptable format. Thank you for your attention to this matter.

Sincerely,

Jay Donnelly

Jay Donnelly
Clinton County GIS Coordinator
850 Fairfax Street - Room 124
P.O. Box 53
Carlyle, Illinois 62231
Voice: 618-594-8571
Fax: 618-594-8599
gis@clintonco.illinois.gov

Cc: Ray Kloeckner, Clinton County Board Chairman
Kevin Terveer, Southwestern Illinois Planning Commission
Nicholas Pinter, Professor of Geology at SIUC

Multi-Hazard Mitigation Plan

Clinton County Planning Team Oversight Meeting, Assembly of the Clinton County Planning Team, Meeting #1:
Clinton County Board Chair, Clinton County ESDA Coordinator, Southwestern Illinois Metro & Regional Planning Commission, SIUC Geology Department, and IUPUI-Polis

Meeting Date: Tuesday, December 2, 2008 2:00 pm

Meeting Time: 1.5 hours
Place: Clinton County Board Room

Attendance:
Ray Kloeckner, Clinton County Board Chairman
Jonathan Remo, SIUC Geology
Nicholas Pinter, SIUC Geology
Dave Coats, Polis
John Buechler, Polis
Dick Crocker, Clinton County ESDA
Todd Peppenhorst, Clinton County ESDA
John Skain, Clinton County 911
Jay Donnelly, Clinton County GIS
Neal Richter, Clinton County Highway Department
Timothy Schleper, City of Breese
Kevin Terveer, Southwestern Illinois Metro & Regional Planning Commission
Linda Tragesser, Southwestern Illinois Metro & Regional Planning Commission

The meeting was called to order.

Introduction to the Multi-Hazard Mitigation Planning Process

An outline of the pre-disaster mitigation planning process was presented by John Buechler, Dave Coats, and Nicholas Pinter.

Dave Coats introduced the Planning Team Website. A username and password was given to the planning team to access the web site. He explained that this website is used to schedule meeting dates, contact information and to download material pertaining to the planning process.

Dave Coats noted that there are several components to the planning process. The 1st phase is to organize all the resources. The primary resource is the planning team members. Other resources will include GIS Data and Data from the Supervisor of Assessments Office.

This project is funded by a match grant from FEMA. A twenty-five percent local match will be required from each county to fund this project. The match will be met by sweat equity and GIS data acquired from each county. Sweat equity will be an accumulation of time spent at the meetings, on research assignments, surveys, time spent reviewing a document and time spent producing the planning document. The value of the match is estimated to be $10,000 to $15,000.

The 2nd phase is to assess the risk of the hazards that are present in the county. A profile of the county will be provided by Southwestern Illinois Metro & Regional Planning Commission. Phase 3 of this planning process is to develop a strategy and the projects that the county is interested in. Phase four is the implementation of those strategies over a period of time and monitoring their progress.

Nicholas Pinter added that this is not just an intellectual process. There will be work and research that will need to be performed to finish this project and to get funding for potential projects that result from this plan.

Dave Coats stated that FEMA will not provide funding for projects where the county has not produced a Pre-disaster Mitigation Plan. In the 1st meeting, the planning team will review and will be asked to research the location of all critical facilities within the county. He also discussed a plan for public participation. He explained that all of the meetings are open to the public but there will be a particular effort made to invite the public to the 3rd meeting when the plan is in draft form. At that meeting, SIUC Geology staff will discuss the geology of the area and several facts about this particular county.

In the 2nd meeting, a discussion will focus on disasters that are prone to this area. These hazards will be given a probability rating and ranked in a probability hierarchy. Polis and SIUC Geology will research these hazards and rank them. A special effort to encourage the public to attend and participate in the 3rd meeting . The Polis and SIUC Geology staff will produce a risk assessment in draft form; each planning team member will get a copy. Strategies and projects will be presented that FEMA and other counties have undertaken.

The 4th meeting consists of a brain storming session focused on the disasters that were modeled and what was learned about them through the analysis of the Chapter 4. The Planning Team will consider strategies and projects mitigate potential loss and damage. FEMA requires that for every identified potential hazard, a strategy to mitigate the loss and damage must be in place. The strategies may range from educational awareness to hardening a building or constructing a levee. Following that meeting, the plan will be in final draft form.

At the 5th meeting the planning team will review and adopt the plan prior to forwarding it to IEMA. IEMA will review the plan and will make recommendations to it as they see fit and then it is submitted to FEMA for review and approval. Once it is approved by FEMA, the plan is sent back to the county.

At the 6th meeting the planning team will present the plan to the Clinton County Board to be adopted. Every incorporated community must have one of these plans, or the communities may be included under the umbrella of the county plan. In order for that to happen, communities are encouraged to participate and contribute to plan development. Once the County Board has adopted the plan, each incorporated community will need to adopt the plan as well. Once the plan has been submitted to FEMA, local governments are eligible to apply for grants to mitigate these established hazards.

From there informal discussions began between attendees and team leaders concerning data that has already been made available to the SIU-C staff and that information still needed. Discussion concerning various critical facilities resulted in a commitment by Clinton County key staff to complete identification of critical facilities provide the information to the SIU-C for completion of various mapping.

With remarks concluded, and no further discussion, the meeting was adjourned.

CLINTON COUNTY MHMP MEETING

SIGN IN SHEET

12/2/08

NAME	AFFILIATION
LINDA TRAGESSER	Southwestern IL. PLANNING COMM
TIMOTHY SCHLEPER	CITY OF BREESE
Neal Richter	Clinton County Highway Dept.
John SKAIN	CLINTON COUNTY 911 & IT
Jay Donnelly	Clinton County GIS
Todd Peppenhorst	Clinton County ESDA
Dick Crocker	Clinton County ESDA
Kevin Tebbe	SIMAPC
Ray Kloeckner	CLINTON CTY CHAIRMAN

Multi-Hazard Mitigation Plan

Clinton County Identification and Prioritization of Disasters :Meeting #2 :

Chairman & Primary Point of Contact: Richard Crocker, Clinton County ESDA Coordinator
Plan Directors: Southwestern Illinois Metro & Regional Planning Commission, SIUC Geology Department, and IUPUI-Polis

Meeting Date: Wednesday, May 5, 2009, at 2:00 p.m.

Meeting Time: 1.5 hours

Place: Clinton County Board Room

Planning Team/Attendance:

Ray Kloeckner, Clinton County Board Chairman
Andy Flor, SIUC Geology
Jonathan Remo, SIUC Geology
Nicholas Pinter, SIUC Geology
Dave Coats, Polis
John Buechler, Polis
Dick Crocker, Clinton County ESDA
Joyce Lucas, Clinton County Zoning
Linda Mensing, Clinton County CCAO
Rodney Rakers, Clinton County ESDA
John Skain, Clinton County 911
Jay Donnelly, Clinton County GIS
Neal Richter, Clinton County Highway Department
Tom La Caze, Clinton County Clerk, New Baden
Timothy Schleper, City of Breese
Cindy Dawson, Trenton
Darlene Ewers, Trenton
Ken McElroy, Beckemeyer
William Guile, Hoffman
Gerald Kohnen, Germantown
Herman Jansen, Damiansville
Norman Horstman, Damiansville
Kevin Terveer, Southwestern Illinois Metro & Regional Planning Commission
Linda Tragesser, Southwestern Illinois Metro & Regional Planning Commission
Jonathan Remo SIUC Geology
Nicholas Pinter SIUC Geology
Dave Coats Polis Center
John Buechler Polis Center

The meeting was called to order.

Hazard Identification and Prioritization

Nicholas Pinter of The SIU-C Geology Department advised the group that the purpose of Meeting #2 is to identify hazards and risks that threaten the citizens, facilities, and infrastructure that have been identified for Clinton County in our previous meetings. The previous Clinton County Comprehensive Emergency Management Plan (CEMP) did not contain a risk analysis. Additional local planning documents were reviewed to identify historical hazards and help identify risk, FIRM maps were discussed for the flood analysis.

The planning team developed and ranked a list of hazards that affect the county. The team identified

1) severe thunderstorms with tornadoes
2) winter storms
3) earthquakes, and
4) flooding which occurs on an annual basis during the spring.

The team also identified Clinton County's principal technological hazards (in order of likelihood):

1) land transportation accidents with hazardous material release,
2) mine subsidence, and
3) fire\explosion.

In addition to these identified hazards, the MHMP planning committee reviewed the list of natural hazards prepared by FEMA, and historical storm event data was compiled from the National Climatic Data Center. This NCDC data included 280 reported events in Clinton County between February 25, 1956 and April 2, 2008

Dr. Pinter advised that in addition to NCDC data, Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail will be plotted in the display maps that will be provided at the Public Meeting.

Hazard Ranking Method

Based on planning team input the hazards Clinton County will address in this multi-hazard mitigation plan as follows:

Tornado
Severe Thunderstorms
Winter Storms
Hazardous Material Transportation
Earthquakes
Mine Subsidence
Flooding
Fire/Explosion

Calculating the Risk Priority Index

The first step in determining the Risk Priority Index (RPI) was to have the planning team members generate a list of hazards which have befallen or could potentially befall their community. Next, the planning team members were asked to assign a likelihood rating based on the criteria and methods described in the following table. This ranking was based upon previous history and the definition of hazard. Using the definitions given, the likelihood of future events is "Quantified" which results in the classification within one of the four "Ranges" of likelihood.

Probability	Characteristics
4 - *Highly Likely*	Event is probable within the calendar year. Event has up to 1 in 1 year chance of occurring. (1/1=100%) History of events is greater than 33% likely per year.
3 - *Likely*	Event is probable within the next three years. Event has up to 1 in 3 years chance of occurring. (1/3=33%) History of events is greater than 20% but less than or equal to 33% likely per year.
2 - *Possible*	Event is probable within the next five years. Event has up to 1 in 5 years chance of occurring. (1/5=20%) History of events is greater than 10% but less than or equal to 20% likely per year.
1 - *Unlikely*	Event is possible within the next ten years. Event has up to 1 in 10 years chance of occurring. (1/10=10%) History of events is less than or equal to 10% likely per year.

Next, planning team members were asked to consider the potential magnitude/severity of the hazard according to the severity associated with past events of the hazard.

Magnitude/Severity	Characteristics
8 - *Catastrophic*	Multiple deaths. Complete shutdown of facilities for 30 or more days. More than 50% of property is severely damaged.
4 - *Critical*	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least 14 days. More than 25% of property is severely damaged.
2 - *Limited*	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than seven days. More than 10% of property is severely damaged.
1 - *Negligible*	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10% of property is severely damaged.

Finally, the RPI was calculated by multiplying the probability by the magnitude/severity of the hazard. Using these values, the planning team members where then asked to rank the hazards. The following shows the RPI and ranking for each hazard facing Clinton County as determined by the discussion of the planning team members.

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Tornado	4 - Highly Likely	2 - Limited	8	1
Severe Thunderstorms	4 - Likely	2 - Limited	8	2
Winter Storms	2 - Possible	4 - Critical	8	3
Hazardous Material Transportation	2 - Possible	2 - Limited	4	4
Earthquakes	2 - Possible	4 - Critical	8	5
Mine Subsidence	3 - Likely	1 - Negligible	3	6
Flooding	2 - Possible	1 - Negligible	6	7
Fire/Explosion	1 -Unlikely	1 - Negligible	8	8

The discussion made it clear that the jurisdictions in Clinton County differ in their susceptibilities to certain hazards—for example, village of Albers located along Lake and Grassy branch is more likely to experience significant flooding than Trenton which is located a substantial distance away from any substantial stream or river which could potentially cause significant flooding—the hazards identified by the planning team were ranked by planning team members for their respective jurisdictions using the methodology previously discussed. Some communities were not represented at the hazard ranking meeting, and for these communities the hazards identified by the planning team will be ranked by SIUC. The SIUC rankings will be based on input from the other planning team members, available historical data, and the hazard modeling results.

Jurisdiction	Hazard							
	Tornado	HAZMAT	Earthquake	Thunderstorms	Flooding	Winter Storms	Subsidence	Fire/Explosion
Albers	1	4	5	2	7	3	6	8
Aviston	1	4	5	2	6	3	NA	7
Beckemeyer	2	4	5	3	7	1	6	8
Bartelso	2	3	5	1	4	7	NA	NA
Breese	1	4	5	2	6	3	7	8
Carlyle	1	4	5	2	6	3	NA	7
Centralia*	1	3	5	2	6	4	7	8
Damiansville	1	4	5	2	7	3	NA	NA
Hoffman	2	7	4	1	6	5	3	8
Huey*	1	4	5	2	6	3	NA	7
Germantown	4	5	7	2	1	3	6	8
New Baden	1	4	5	2	7	3	6	8
Trenton	2	5	4	1	7	3	6	NA

* To be Ranked by SIU-C

The planning team discussed the continued identification/location of critical facilities so SIU-C can map and model these facilities according to threats identified within two weeks. The next meeting will be a public meeting to report on the hazards modeled and threats identified. That meeting will be held at the end of June and will be held in the evening (7:00) at the Clinton County Board Room. The meeting will be publicized by press release and the public will be encouraged to attend and provide input.

Meeting was adjourned.

CLINTON COUNTY

MULTI-HAZARD MITIGATION PLAN

MEETING #2

May 5, 2009 2:00 P.M

CLINTON COUNTY BOARDROOM

ATTENDEES

NAME	ORGANIZATION	ADDRESS	PHONE	E-MAIL
Nicholas Pinter	SIUC	Geology Dept. SIUC Carbondale IL 62901	618-453-7375	npinter@geo.siu.edu
Rodney Kakers	ESDA	611 W. ST Beckemeyer Il 62219	618-227-8608	
Cindy Dawson	Trenton Emergency Management Service	17 E. 2nd St. Trenton IL 62293	618-910-4293	Cinel2978@yahoo.com
Darlene Ewers	Trenton Emergency Management Serv.	336 Northland ct. Trenton	618-971-8764	darilupos@sbcglobal.net
Ken McElroy	Village of Beckemeyer	191 E. 1st Street P.O. BOX 278 Beckemeyer, IL. 62219	618-227-8321	chiefmcelroy@gmail.com
William A. Emile	Village of Hoffman	128 W STA P.O. Box 264 Hoffman Il 62250	618-495-2649	bquile@frontiernet.net
GERALD KOHNEN	Village of GERMANTOWN	907 Cindy ST GERMANTOWN IL 62245	618-523-4243	GKohnen@charter.net.Com
Herman "Bud" Jansen	Village of Damiansville	206 Pear ST Damiansville IL 62215	618-248-5359	BudJansen@charter.net
Norman Horstmann	Village of Damiansville	105 Walnut Damiansville, Ill. 62215	618-248-5393	Noros4@HotMail.Com
Jay Donnelly	Clinton County	850 Fairfax St Room 124	618-594-8571	gis@clintonco.illinois.gov
Tom LaCaze	Clinton County Clerk	New Baden 850 Fairfax St P.O. 308	618-594-[illegible] Ext 650	ccclerk@clintonco.illinois.gov
Linda Mensing	Clinton Co. CCAO	850 Fairfax St Carlyle 62231	618-594-0128	Assessor@clintonco.illinois.gov
Joyce Lucas	ZONING OFFICE	" ALBERS	618-594-0124	ZONING@ " "
TIMOTHY SCHLEPER	CITY OF BREESE	800 NORTH 1ST, BREESE IL 62230	618-526-7151	tschleper@charter.net

CLINTON COUNTY

MULTI-HAZARD MITIGATION PLAN
MEETING #2
May 5, 2009 2:00 P.M
CLINTON COUNTY BOARDROOM
ATTENDEES

NAME	ORGANIZATION	ADDRESS	PHONE	E-MAIL
Richard Crocker	CLINTON COUNTY ESDA	930C FAIRFAX ST. CARLYLE, IL 62231	618-594-4460	CCESDA@CLINTONCO.ILLINOIS.COM
RAY KLOECKNER	CLINTON CTY BD CHAIRMAN	4626 COURT RD GERMANTOWN IL 62245	618 248 5448	RAK022441@HOTMAIL.COM
LINDA TRAGESSER				

SOUTHWESTERN ILLINOIS PLANNING COMMISSION

PRESS RELEASE

2511 Vandalia Street
Collinsville, IL 62234-5034
(618) 344-4250
FAX: (618) 344-4253

June 9, 2009

For Immediate Release

For more information contact: Richard Crocker
Clinton County Emergency Service S & Disaster Agency
(618) 594-4455

OR

Linda Tragesser, Southwestern Ill Planning Commission
(618) 344-4250 ext. 110

MULTI-HAZARD MITIGATION PLAN PUBLIC MEETING

The Clinton County Hazard Mitigation Steering Committee will host a public information and strategy planning session at 7:00 p.m. on Tuesday, June 23, 2009 in the Clinton County Board Room, 810 Franklin Street, Carlyle.

Clinton County and Southwestern Illinois Planning Commission have formed an alliance with The Polis Center of IUPUI to identify potential natural hazards and to produce a mitigation plan to address the issues. The ongoing efforts of the partnership will result in a Multi-Hazard Mitigation Plan (MHMP), which will seek to identify potential natural hazards for Clinton County, and then establish a mitigation measure that is intended to reduce or eliminate the negative impact that a particular hazard may have on the locality.

Over the last several months, the steering committee has been working with The Polis Center at Indiana University-Purdue University Indianapolis (IUPUI) and staff from the SIU -Carbondale Geology Department to develop a Multi-Hazard Mitigation Plan (MHMP) for the county to submit to the Federal Emergency Management Agency for approval.

The Federal Emergency Management Agency (FEMA) now requires each unit of government in the United States to have a FEMA-approved MHMP, so completion of the Clinton County plan is critical. The MHMPs will serve as framework for developing hazard mitigation projects that will reduce the negative impacts of future disasters on the communities. Examples of projects that have been completed by some communities include storm shelters, warning sirens, flood walls, and fire protection enhancements.

The steering committee identified the following hazards: flooding, tornado, thunderstorms/ high winds/hail, hazardous materials release, drought/extreme heat, earthquake, and severe winter storms. The committee then selected hazards for The Polis Center to model with HAZUS-MH, a GIS-based risk mitigation tool developed by FEMA. HAZUS-MH is capable of predicting the probable impacts of specific disasters in terms of financial, human life, and safety impacts, as well as various others. At the June 24th meeting the steering committee will discuss formulated strategies and mitigation activities for each potential disaster.

Once the plan is completed, the committee will submit it to FEMA for approval. The committee will also work to develop funding for any mitigation activities that are identified.

The steering committee is interested in receiving public input on the plan. Anyone who has questions or would like to provide input should contact Richard Crocker, Coordinator, Clinton County Emergency Management (618) 594-4455.

Multi-Hazard Mitigation Plan Minutes

Assembly of the Clinton County Planning Team, Public Meeting, Meeting #3:

Chairman & Primary Point of Contact: Richard Crocker, Clinton County ESDA Coordinator
Plan Directors: Southwestern Illinois Metro & Regional Planning Commission, SIUC Geology Department, and IUPUI-Polis

Meeting Date: Wednesday, June 23, 2009 at 7:00 p.m.

Meeting Time: 1.5 hours

Place: Clinton County Board Room

Planning Team/Attendance:

Ray Kloeckner, Clinton County Board Chairman
Jonathan Remo, SIUC Geology
Nicholas Pinter, SIUC Geology
Dick Crocker, Clinton County ESDA
Joyce Lucas, Clinton County Zoning
Jay Donnelly, Clinton County GIS
Steve Heiligenstein, Clinton County Board, City of Carlyle
Lt. Greg Dodson, City of Centralia Police Department
J. Sullivan, Clinton County Board, City of Trenton
William Guile, Hoffman
Ruth Jansen, Damiansville
Linda Tragesser, Southwestern Illinois Metro & Regional Planning Commission

The meeting was called to order.

Dr. Nicholas Pinter welcomed everyone to the meeting and introduced the lead agencies and plan directors involved in the formulation of the Clinton County Multi-Hazard Mitigation Plan. He provided the audience with background information concerning the County's need for a Multi-Hazard Mitigation Plan and explained that this project is mandated by the Federal Disaster Mitigation Act of 2000. Dr. Pinter pointed out that the plan was being done at no cost to Clinton County thanks to a grant received from FEMA and the Illinois Emergency Management Agency, and that the County's twenty-five percent required match to FEMA's grant would be provided by work and data input into to the plan by County staff, and by the "sweat equity" provided by the Planning Team participants.

Dr. Pinter then explained that this was the third in a series of Plan meetings, and is planned as a public meeting to present the Hazard Risk Assessment that had been developed with input received during the first two meetings of the Planning Team, and through computer modeling carried out by the SIU-Carbondale Geography Department and facilitated by the POLIS group from IUPUI. Dr. Pinter then proceeded with the presentation of the Hazard Risk Assessment.

Hazard Risk Assessment

Dr. Pinter began his presentation by providing a list of natural hazards that had occurred historically within the County and provided a rating of their potential risk. He explained that the list had been discussed, expanded, and prioritized during the second meeting of the Planning Team, and that the list is in draft form and subject to reevaluation during the planning process. Dr. Pinter then provided historical references of past natural hazard occurrences in Clinton County and discussed the extent to which these hazards had impacted the County. He went on to suggest some solutions the County could act upon to limit or eliminate the effect hazards might have in the future. These solutions primarily involved avoidance of, protection from, and preparation for the hazards. He provided the definition of mitigation and explained how hazard mitigation evolves in the planning process.

Dr. Pinter then present the full risk assessment that is included in Section 4 of the draft plan document after briefly describing all of the different Sections included in the draft plan. He outlined the format of Section 4, and detailed the sources from which the information was accumulated. He explained how the methods and calculation were established, and focused on particular hazards that had been modeled by the HAZUS-MH computer software that simulates the circumstances and resulting cost analysis generated by a given, defined hazard. In particular, he outlined the modeling developed for:

- a hypothetical F-4 tornado,
- a hypothetical 100-year over-bank flood event,
- a hypothetical 7.7 earthquake along the New Madrid Fault,
- a 5.5 earthquake along the Wabash Valley Fault, and
- an ALOHA Plume modeling for an ammonia leak hypothetically occurring in the City of Breese.

Estimates of the numbers of buildings and facilities damaged, as well as cost estimates and loss of life estimates were presented for each of the scenarios.

Following the presentation on risk assessment Dr. Pinter explained that at the next meeting of the Planning Team would be for the purpose of identifying mitigation projects and strategies that needed to be planned and implemented in the County and its communities in order to minimize or reduce the risk presented by the potential hazards identified. Each person would receive a copy of the FEMA publication, ***"Mitigation Ideas",*** and Dr. Pinter asked each person to come to the next meeting prepared to provide five ideas they think need to occur in the County, or in their community, to mitigate for the hazards identified.

Dr. Pinter further explained that once all the information and suggestions on mitigation and plan implementation are compiled, a preliminary draft of the plan document will be provided to the Planning Team for discussion and approval. Following local review, revision, and approval a final draft is forwarded to IEMA for review and approval. The IEMA then submits the draft plan to

FEMA for its approval. Following FEMA approval, the document is then presented by the Planning Team to the Clinton County Board for Adoption, and would then be submitted to the municipal councils and boards for adoption.

The next meeting of the Clinton County MHMP committee will be scheduled for August or early September, 2009 at the Clinton County Board Room at 2:00 p.m.

Meeting was adjourned.

CLINTON COUNTY

MULTI-HAZARD MITIGATION PLAN
MEETING #3 – Public Meeting
June 23, 2009 7:00 P.M
CLINTON COUNTY BOARDROOM
ATTENDEES

NAME	ORGANIZATION	E-MAIL
Dick Cranford	Clinton Co. ESDA	ccesda@clintonco.illinois.gov
Joyce Lucas	Zoning Clinton Co.	zoning@clintonco.illinois.gov
[illegible]	Village of Albers	[illegible]@frontiernet.net
Ray Kloeckner	Cl Cty BD CH.	RAK022441@HOTMAIL.COM
Steve Heiligenstein	CL Cong Board	stevehstein@att.net
[illegible]	Centralia PD	[illegible]357@yahoo.com
Ruth Jansen	Damiansville Village Board	ruthjansen@charter.net
Jay Donnelly	Clinton County	gis@clintonco.illinois.gov
J Sullivan	Clinton County Board	sully94@sbcglobal.net
Nicholas Pinter	SIUC	npinter@geo.siu.edu
Jonathan Remo	SIUC	
LINDA TRAGESSER	SIMAPC	

Multi-Hazard Mitigation Plan Minutes

Assembly of the Clinton County Planning Team, Mitigation Strategies, Meeting #4:

Chairman & Primary Point of Contact: Richard Crocker, Clinton County ESDA Coordinator
Plan Directors: Southwestern Illinois Metro & Regional Planning Commission, SIUC Geology Department, and IUPUI-Polis

Meeting Date: Wednesday, September 2, 2009 at 2:00 p.m.

Meeting Time: 1.5 hours

Place: Clinton County Board Room

Planning Team/Attendance:

Ray Kloeckner, Clinton County Board Chairman
Dick Crocker, Clinton County ESDA
James Sullivan, Clinton County Board, City of Trenton
Joyce Lucas, Clinton County Zoning, Village of Albers
Jay Donnelly, Clinton County
Timothy Schleper, City of Breese
Michael Jones, City of Trenton, Police & EMS
Gerald Kohnen, Germantown
Francis Billhartz, Damiansville
Derek Sudholt, Village of Aviston President
Mike Buscher, Village of Aviston
Jack Wilken, Village of Bartelso President
Tim Foehne, Village of Bartelso
Robert Fix, Clinton County Board, City of Breese
Greg Dodson, City of Centralia
Jay Tucker, President, Village of Huey
Linda Tragesser, Southwestern Illinois Metro & Regional Planning Commission
Jonathan Remo SIUC Geology
Nicholas Pinter SIUC Geology
Dave Coats Polis Center
John Buechler Polis Center

The meeting was called to order

Jonathan Remo of SIU-C Geography Department reviewed the objectives of this planning project, and reviewed progress on the plan to date. Dr. Remo explained the purpose of today's meeting as developing Mitigation Strategies for the hazards that have previously been identified and prioritized.

Each member had a copy of the FEMA publication, ***Mitigation Ideas***. The group then went through the list of hazards discussing each, identifying mitigation activities the County or a community might already have enacted, and addressing each hazard with one or more mitigation idea. After all the strategies were listed Dr. Remo asked the attendees to prioritize them weighing their overall merit against the estimated benefits of each mitigation action.

The following list of Mitigation Activities already implemented was identified:

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Implement Nixle for mass media release via e-mail and text messages	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	The county and its incorporated jurisdictions have implemented this project.
Establish emergency telephone notification system	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective: S**trengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Trenton	The City of Trenton has implemented this project.
Establish Storm Ready Communities	**Goal:** Develop long-term strategies to educate Clinton County residents on the hazards affecting their county **Objective:** Raise public awareness on hazard mitigation.	Flood, Tornado, Thunderstorm	Trenton, Centralia	This project was successfully completed.
Implement Reverse 911	**Goal:** Lessen the impacts of hazards to individuals and infrastructure **Objective: S**trengthen the communication between emergency management and the public.	Tornado, Flood, Thunderstorm, Winter Storm	Aviston	The community has implemented this project.
Purchase weather radios for schools, community center, and nursing home	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Equip public facilities and communities to notify large or at risk groups of immanent severe weather so appropriate measures to protect their populations can be taken.	Flood, Tornado, Thunderstorm, Winter Storm	Trenton	The community has implemented this project.
Complete a CEMP	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County	The county completed this project.
Establish a tie-down ordinance for mobile home safety	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Tornado	Clinton County	The county completed this project.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Comments
Establish mutual aid agreements: MABUS, ILEAS	**Goal:** Lessen the impacts of incident /disasters to individuals and infrastructure **Objective:** Provide communities with the trained responders and equipment to respond to natural and technological incidents/disasters.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County	The county completed this project.
Establish a generator agreement	**Goal:** Lessen the impacts of incident /disasters to individuals and infrastructure **Objective:** Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Winter Storm	Trenton	The community has implemented this project.
Develop a countywide emergency route	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Winter Storm	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	The county completed this project.
Establish an LEPC agreement with Washington County, Illinois	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Hazmat	Clinton County	The county completed this project.
Establish a hazmat mutual assistance agreement with St. Clair County	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Hazmat	Clinton County	The county completed this project.
Set up hazmat training exercises with Washington County	**Goal:** Develop long-term strategies to educate Clinton County residents on the hazards affecting their county **Objective:** Improve education and training of emergency personnel and public officials	Hazmat	Clinton County	The county completed this project.

Itemized list of Hazards along with location information and priority assigned.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Purchase additional sirens throughout the county as an early warning system	**Goal:** Lessen the impacts of incident s/disasters to individuals and infrastructure **Objective:** Evaluate and strengthen the communication abilities of emergency services throughout the county.	Tornado, Thunderstorm	Clinton County	High	The county's existing sirens are not sufficient. Funding has not been secured as of 2009, but the PDM program and community grants are an option. If funding is available, implementation will begin within one year.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Procure transfer switches for generators in critical facilities	**Goal:** Lessen the impacts of incident s/disasters to individuals and infrastructure **Objective:** Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.	Winter Storm	Clinton County	High	The county ESDA will oversee implementation of this project. Funding has not been secured as of 2009, but the PDM program and community grants are an option. If funding is available, implementation will begin within one year.
Conduct engineering study to assess the safety of critical facilities	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Flood, Tornado, Earthquake, Thunderstorm, Winter Storm, Subsidence	Clinton County	High	The ESDA director with assistance from the county engineer will oversee this project and will work with an engineering firm. The county will seek a planning grant from community improvement programs. If funding is available, implementation will begin within one year.
Institute a buy-out plan for a Senior Services Facility in Trenton	**Goal:** Lessen the impacts of flooding to individuals and infrastructure. **Objective:** Support compliance with the NFIP for each jurisdiction in Clinton County.	Flood	Trenton	High	The County ESDA director and County Floodplain Manager will oversee the implementation of the project. Funding has not been secured as of 2009 but will be sought from funding sources such as IEMA and FEMA. Implementation, if funding is available, is forecasted to begin within one year.
Develop a public education program to explain hazard communications, emergency plans, and generator safety	**Goal:** Develop long-term strategies to educate Clinton County residents on the hazards affecting their county **Objective:** Raise public awareness on hazard mitigation.	Flood, Tornado, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	Medium	The county ESDA director will oversee this project. Local resources, such as railroad/train companies and schools, will be used to develop educational literature and present to each jurisdiction at public events or in schools. If resources are available, the project will be implemented within three years
Improve drainage in along important transportation routes in the county: Old Route 50 in Trenton, State Route 50 and 160 in Trenton, State Route 50 and Germantown Road in Breeze, State Route 161 west side of Centralia, City of Centralia along railroad line	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Minimize the amount of infrastructure exposed to hazards.	Flood	Clinton County, Trenton, Breeze, Centralia	Medium	The ESDA director with assistance from the county engineer will work with ILDOT and IDNR to evaluate the current conditions of the county's waterways and drainage and develop a plan. Funding has not been secured as of 2009, but county, state, and federal funding will be sought. Implementation will begin within three years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Improve railroad crossings	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Improve conditions at railroad crossings to reduce the risk of accidents and potential hazardous material releases.	Hazmat	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	Medium	The county ESDA director and LEPC will oversee this project. Local resources, e.g. rail companies, will be used to implement this project, and funding will be sought from local resources and community grants. If funding and resources are available, the project will begin within three years.
Install inertial valves at critical facilities	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.	Earthquake	Clinton County	Medium	The county ESDA director will oversee implementation of this project. Funding has not been secured as of 2009, but the PDM program and community grants are an option. If funding is available, implementation will begin within three years.
Create a Web-based distributive GIS to disseminate data to local communities	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** To efficiently distribute information between jurisdictions to aid in hazard and other community planning	Flood, Tornado, Earthquake, Thunderstorm, Winter Storm, Hazmat, Subsidence	Clinton County	Medium	The ESDA director will work with County's GIS coordinator and local resources to research training and implementation opportunities. The county may request funding for training from community resources grants. If funding is available, implementation will begin within three years.
Establish safe rooms in key locations within the county, e.g. mobile parks, schools, community centers	**Goal:** Lessen the impacts of incidents /disasters to individuals and infrastructure **Objective:** Improve emergency sheltering in Clinton County.	Tornado, Thunderstorm	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	Medium	The ESDA director will work with local shelters, schools, healthcare facilities, and first responders to identify locations to establish safe rooms. The county may opt to conduct an engineering study to determine best locations. The PDM program or local resources are funding options. If funding is available, implementation will begin within three years.
Create maps of undermined areas in the county	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Subsidence	Clinton County	Low	The county ESDA director, county engineer, or GIS coordinator will oversee this project. The county will seek assistance from IDNR. If funding is available, implementation will begin within five years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Purchase signage for roads that flood frequently	**Goal:** Lessen the impacts of incidents /disasters to individuals and property **Objective:** Communication of the hazard to individuals in order to eliminate deaths, injuries, and damage to property.	Flood	Clinton County	Low	The ESDA director and/or county engineer will oversee this project and will seek funding from resources such as ILDOT or the PDM program. If funding is available, implementation will begin within five years.
Conduct a sewer upgrade to separate stormwater and sanitary sewer lines	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Minimize the amount of infrastructure exposed to hazards.	Flood	Clinton County, Albers, Aviston, Bartelso, Beckemeyer, Breese, Carlyle, Centralia, Damiansville, Germantown, Hoffman, Huey, New Baden, Trenton, Wamac	Low	The ESDA director and county or town engineer will work with ILDOT and IDNR to evaluate the current conditions of the community's sewer system and develop a plan. Funding has not been secured as of 2009, but county, state, and federal funding will be sought. Implementation will begin within low years.
Construct or identify a new shelter	**Goal:** Lessen the impacts of severe weather to individuals and property **Objective:** Improve emergency sheltering in Clinton County.	Tornado, Thunderstorm	Trenton, Clinton County	Low	The ESDA director will work with American Red Cross to establish the shelter. The PDM program or local resources are funding options. If funding is available, implementation will begin within five years.
Develop alternative methods of fueling for natural gas generators	**Goal:** Lessen the impacts of hazards to new and existing infrastructure **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Earthquake	Clinton County	Low	The EDS director will oversee this project. The county will seek help and potential funding from IEMA or FEMA to implement the study. If funding is available, implementation will begin within five years.
Create a railroad inventory/database to improve communication with rail companies	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Hazmat	Clinton County	Low	The ESDA director will work with local rail companies to implement this project. Local resources will be used to create and maintain the database. If resources are available, implementation will begin within five years.
Improve and enforce building codes and seismic standards	**Goal:** Create new or revise existing plans/maps for Clinton County **Objective:** Review and update existing, or create new, community plans and ordinances to support hazard mitigation.	Earthquake	Clinton County	Low	The ESDA director and county engineer will work with the local planning commission to review building code standards. The MHMP planning committee will review and revise codes as necessary. If local resources are available, implementation of this project will begin within five years.

Following the prioritization exercises and recording the results, Dr. Remo advised that at the next meeting we will review and discuss the preliminary draft of the plan and make updates or corrections.

Meeting #5 will be held in late October at the Clinton County Board Room.

Meeting was adjourned.

CLINTON COUNTY
MULTI-HAZARD MITIGATION PLAN COMMITTEE MEETING
SEPTEMBER 2, 2009 2:00 P.M.
CLINTON COUNTY BOARD ROOM

ATTENDEES

NAME	REPRESENTING	MUNICIPALITY OF RESIDENCE	E-MAIL
Joyce Luccan	County ZA	Village of Aviston	
[illegible]	County Board D#4	Trenton	SULLY94@SBCGLOBAL.NET
Francis Billhartz	Damiansville	Damiansville	fkbillhartz@charter.net
Derek Sudholt	Aviston	Aviston	DEREK@SUDHOLTSM.COM
Mike Burke	Village of Aviston	Aviston	mbbaviston@yahoo.com
Timothy Schleper	Breese, City of	Breese	tschleper@charter.net
Jack Wilhelm	Bartelso	Bartelso	JACKCLEO@HOTMAIL.COM
Tim Foehne	Bartelso Village	Bartelso	foehnetim@yahoo.com
Dick Crocker	CC ESDA	Clinton Co.	ccesda@clintonco.illinois.gov
Ray Kloeckner	CH Clinton Cty BD.	Clinton Co	RAK022441@HOTMAIL.COM
Jay Donnelly	Clinton County & Carlyle	Carlyle	gis@clintonco.illinois.gov
Robert Fix	C.C. Board Dist. 3 & City of Breese	Breese	rfix2001@yahoo.com
Michael Jones	Trenton PD / Trenton EMS	Trenton	chiefoftrenton[illegible].com
GREG DODSON	CENTRALIA P.D.	CENTRALIA	gdodson359@YAHOO.COM
Jay Tucker	Huey IL	VILLAGE OF HUEY	JTUCKER@AMFAM.COM

Multi-Hazard Mitigation Plan Minutes

Assembly of the Clinton County Planning Team, Mitigation Strategies, Meeting #4:

Chairman & Primary Point of Contact: Richard Crocker, Clinton County ESDA Coordinator
Plan Directors: Southwestern Illinois Metro & Regional Planning Commission, SIUC Geology Department, and IUPUI-Polis

Meeting Date: Wednesday, December 2, 2009 at 2:00 p.m.

Meeting Time: 1.5 hours

Place: Clinton County Board Room

Planning Team/Attendance:

Ray Kloeckner, Clinton County Board Chairman
Jonathan Remo, SIUC Geology
Dick Crocker, Clinton County ESDA
James Sullivan, Clinton County Board, City of Trenton
Joyce Lucas, Clinton County Zoning, Village of Albers
Jay Donnelly, Clinton County
Gary Rakers, Village of Aviston
Cindy Dawson, City of Trenton
Jay Tucker, President, Village of Huey
Linda Tragesser, Southwestern Illinois Metro & Regional Planning Commission
Jonathan Remo SIUC Geology

The meeting was called to order

Dr. Remo of SIU-C explained the planning process thusfar, and described the method we would use to review the draft copy of the plan. Linda Tragesser of Southwestern Illinois Metropolitan and Regional Planning Commission provided everyone with a PDF copy of the preliminary draft of the Bond County Plan prior to the meeting so that everyone could review it. She acknowledged that the draft had been updated with information provided by Dr. Remo of SIU-C subsequent to the circulation of the draft copies to the committee.

Committee members were asked to voice any opinions or suggest any corrections or changes that need to be made in the plan. The following is a summary of the changes needing to be made:

PLAN SECTION & PAGE	DESCRIPTION	CHANGE NEEDED
Section 1,P. 2, Table 1-1	Planning Team Members	Correction of Names
Section 1,P. 6, Table 1-4	Planning Documents	Corrections and additions
Section 2, P. 7, Table 2-1	Participating Jurisdictions	Corrections of Names
Section 5, P. 95, Table 5-3	Completed/Current Mitigation Actions	Editing of entries in table

Following discussion Dr. Remo reviewed and explained the plan approval process. Plan will be submitted to IEMA and subsequently to FEMA for preliminary approval. Following that the plan will be presented to the Clinton County Board for consideration and adoption. Once the plan is adopted by the County Board it will be presented to each participating jurisdiction for adoption.

Meeting was adjourned.

CLINTON COUNTY

MULTI-HAZARD MITIGATION PLAN COMMITTEE MEETING #5

December 2, 2009 2:00 P.M. CLINTON COUNTY BOARD ROOM

ATTENDEES

NAME	REPRESENTING	MUNICIPALITY OF RESIDENCE	E-MAIL
Joyce Lucas	Clinton County Village of Albers	Albers	
John B Wilken	Village of Bartelso	Bartelso	
Mike Gebke	Village of Bartelso	Bartelso	
Dick Crocker	Clinton Co. ESDA	Carlyle	
Cay Donnelly	Clinton County City of Carlyle	Carlyle	
Gary Rakers	Village of Aviston	Aviston	
Ray Kloeckner	CL Cty BD CH	Albers	
Ernest Wilkins	Clinton Co Board	Trenton	
Cindy Dawson	Madison County Emergency Management City of Trenton	Trenton	
Jay Tucker	Village of Huey	Village of Huey	
Linda Tragesser	SIMAPC		

Appendix B – Articles Published by Local Newpapers

CENTRALIA
Sentinel

SATURDAY, JUNE 13, 2009

Residents sought for hazard planning in Clinton County

Federally funded mitigation plan will cover natural disasters, human errors

BY JOE WITTHAUS
SENTINEL NEWS STAFF

CARLYLE — Natural disasters and emergencies are often more commonplace than many people like to think. Throughout the seasons, a number of events, including tornadoes, earthquakes, thunderstorms and floods, are highly feasible and call for emergency response and care.

In an effort to secure a federally funded program that addresses such potentially hazardous occurrences, the Clinton County Hazard Mitigation Steering Committee will host a public information and strategy planning session at 7 p.m. on June 23 in the Clinton County Board Room at the Clinton County Sheriff's Department.

According to information provided by Linda Tragesser, a community planner for the Southwestern Illinois Planning Commission (SIPC), Clinton County, SIPC and the Southern Illinois University at Carbondale Geology Department have formed an alliance with the Polis Center of Indiana University-Purdue University Indianapolis (IUPUI) to identify potential natural hazards and to produce a mitigation plan to address the issues.

The ongoing efforts of the groups will then result in a Multi-Hazard Mitigation Plan (MHMP) that identifies natural hazards in the county,

Please see Hazard, Page 3A

Hazard:

Continued From Page 1A

and then establishes a mitigation measure to reduce or eliminate the impact of the hazard on area communities.

"This is really an opportunity to get a good, federal plan put together for no charge to the county or its residents," said Tragesser. "This program is fully funded through the federal government, and any eligible county that may not commit must take care of developing such a plan and funding it themselves. We want to hear from the residents and we want to hear any concerns they may have while this plan is being developed."

Tragesser also explained that participation by county residents was also a requirement in order for the plan to remain approved by the Federal Emergency Management Agency (FEMA). Businesses and institutional facilities will also be covered under the plan as the organizations involved with the plan are also hoping to see support from business owners and educational officials.

To date, the steering committee has identified flooding, tornadoes, thunderstorms/high winds/hail, hazardous materials release, drought/extreme heat, earthquakes and severe winter storms as the most prevalent disasters that commonly affect Clinton County.

While the steering committee has held several meetings over the past several months, this meeting will be the first to incorporate public participation. Those who may have questions or would like to provide input may contact Richard Crocker, coordinator for Clinton County Emergency Management, at 594-4455.

jwitthaus@morningsentinel.com

Page 8A • Thursday, June 18, 2009 • Breese Journal

No where to go...

The old adage "knee high by the Fourth of July" may refer to the water level this year in Clinton County rather than the progress of the corn crop. Heavy rains early this week inundated several county roads and fields, leaving farmers with no hope of any spring planting. This photo was taken near the intersection of Highline and Drive-in roads in rural Germantown facing west. Drive-In Road, south of the intersection, was also completely under water.

Multi-Hazard Mitigation Plan public meeting to be held June 23 in Carlyle

Steering Committee seeking public input on the plan

The Clinton County Hazard Mitigation Steering Committee will host a public information and strategy planning session at 7 p.m. on Tuesday, June 23 in the Clinton County Board meeting room, 810 Franklin in Carlyle.

Clinton County and Southwestern Illinois Planning Commission have formed an alliance with The Polis Center of Indiana University-Purdue University Indianapolis (IUPUI) to identify potential natural hazards and to produce a mitigation plan to address the issues. The ongoing efforts of the partnership will result in a Multi-Hazard Mitigation Plan (MHMP), which will seek to identify potential natural hazards for Clinton County and then establish a mitigation measure that is intended to reduce or eliminate the negative impact that a particular hazard may have on a locality.

Over the last several months, the steering committee has been working with The Polis Center of IUPUI and staff from Southern Illinois University at Carbondale's Geology Department to develop a Multi-Hazard Mitigation Plan (MHMP) for the county to submit to the Federal Emergency Management Agency (FEMA) for approval.

FEMA now requires each unit of government in the United States to have a FEMA-approved MHMP, so completion of the Clinton County plan is critical. The MHMPs will serve as a framework for developing hazard mitigation projects that will reduce the negative impacts of future disasters on the communities. Examples of projects that have been completed by some communities include storm shelters, warning sirens, flood walls and fire protection enhancements.

The steering committee identified the following hazards: flooding, tornado, thunderstorms/high winds/hail, hazardous materials release, drought/extreme heat, earthquake and severe winter storms. The committee then selected hazards for The Polis Center to model wit HAZUS-MH, a GIS-based risk mitigation tool developed by FEMA. HAZUS-MH is capable of predicting the probable impacts of specific disasters in terms of financial, human life and safety impacts, as well as various others. At the June 24 meeting, the steering committee will discuss formulated strategies and mitigation activities for each potential disaster.

Once the plan is completed, the committee will submit it to FEMA for approval. The committee will also work to develop funding for any mitigation activities that are identified.

The steering committee is interested in receiving public input on the plan. Anyone who has questions or would like to provide input should contact Richard Crocker, coordinator, Clinton County Emergency Management at 618-594-4455.

Appendix C—Adopting Resolution

Appendix D – Historical Hazards from NCDC

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	8/1/2005	12:00 AM	Drought	N/A	0	0	0	0	Drought conditions improved for some counties of southern Illinois but remained serious for much of west central Illinois. Most of the counties immediately east and south of the St. Louis area were raised to D0 status (abnormally dry). However, west central Illinois remained in D3 status (extreme drought).
Clinton	7/18/1999	12:00 PM	Excessive Heat	N/A	8	119	0	0	A heat wave gripped the region the last 2 weeks of July. Temperatures remained in the middle to upper 90s with a few days topping 100 degrees. The Heat Index ranged from 105 to near 115 degrees. Most of the deaths and injuries occurred in the Metro East area of St. Louis, primarily Madison and St. Clair counties. F86PH, M76MH, F88PH, F52PH, M74PH, M68PH, M80PH, F72PH
Clinton	7/7/2001	11:00 AM	Excessive Heat	N/A	0	0	0	0	The first real heat wave of the summer hit the area July 7 through July 10. Temperatures peaked in the middle to upper 90s with the Heat index ranging from 105 to 110.
Clinton	7/17/2001	11:00 AM	Excessive Heat	N/A	0	0	0	0	A one day heat wave hit on July 17 as the temperature climbed into the lower to middle 90s. The very humid conditions pushed the Heat Index into the 110 to 115 range.
Clinton	7/29/2001	11:00 AM	Excessive Heat	N/A	0	0	0	0	The 3rd mini heat wave of the month hit on July 29 through 31 and continued into early August. High temperatures hit the lower to middle 90s with the humidity pushing the Heat Index to the 105 to 110 range.
Clinton	8/1/2001	12:00 AM	Excessive Heat	N/A	0	0	0	0	The heat wave from late July continued into early August. High temperatures were in the middle 90s with the Heat Index around 105.
Clinton	8/7/2001	12:00 AM	Excessive Heat	N/A	0	0	0	0	A second early August Heat Wave hit the area. High temperatures ranged from the lower to upper 90s with the Heat Index from 102 to 110.
Clinton	8/21/2001	12:00 AM	Excessive Heat	N/A	0	0	0	0	The last heat wave of the summer hit the area for a couple of days. Temperatures were the hottest of the summer with highs in the middle 90s to around 100. The Heat Index ranged from 105 to 110.
Clinton	7/8/2002	11:00 AM	Excessive Heat	N/A	0	0	0	0	High temperatures climbed into the middle to upper 90's with the Heat Indices from 105 to 110 degrees.
Clinton	7/20/2002	11:00 AM	Excessive Heat	N/A	0	0	0	0	High temperatures climbed to the middle to upper 90's with the Heat Indices from 105 to near 115 degrees. St. Louis hit 100 on July 22.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	7/26/2002	11:00 AM	Excessive Heat	N/A	0	0	0	0	High temperatures climbed into the middle to upper 90's with the Heat Indices from 105 to near 115 degrees. There was a one day break in the heat as a weak cold front dropped temperatures back into the upper 80's on July 29. However temperatures quickly rebounded and remained high into August.
Clinton	8/1/2002	11:00 PM	Excessive Heat	N/A	0	0	0	0	The hot temperatures from late July continued into early August. High temperatures were in the upper 90s to around 100 with the heat index from 105 to 115.
Clinton	8/15/2003	12:00 PM	Excessive Heat	N/A	0	0	0	0	A late summer heat wave hit the area just as most schools were opening. As a result many schools reduced their schedule to a half day while a few closed altogether. High temperatures were in the middle to upper 90s with Quincy hitting 100 on the 21st. Heat indices generally ranged from 105 to 110 degrees.
Clinton	8/24/2003	12:00 PM	Excessive Heat	N/A	1	0	0	0	After a brief cool down in which high temperatures dropped into the middle 80's to around 90 degrees, the heat returned to the area with highs pushing into the middle 90's to around 100 degrees. Heat indices were again in the 105 to 110 degree range. There was one death that was blamed on the heat. A 49 year old man died on the 26th from heat related causes in East St. Louis. M49OU
Clinton	7/20/2004	12:00 PM	Excessive Heat	N/A	0	0	0	0	The second heat wave of a relatively cool summer hit the region from July 20 - 22. High temperatures were in the lower to middle 90's with the Heat Index ranging from 105 to 110 degrees.
Clinton	7/20/2005	12:00 PM	Excessive Heat	N/A	1	0	0	0	The first significant heat wave of several years hit all of west central, southwest, and south central Illinois. Quincy hit 100 degrees or higher 4 times during the period and had a Heat Index reading of 121 degrees on July 23rd. The Metro East area of St. Louis saw temperatures top out at 100 or higher on 3 consecutive days, from 7/24 to 7/26. One death was officially attributed to the heat. A 73 year old man in Cahokia was found dead in his home on July 25th. M73PH

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	7/17/2006	12:00 PM	Excessive Heat	N/A	0	0	0	0	Right on schedule, a heat wave hit southern Illinois in mid-July. Temperatures ranged from the middle 90s to around 100. The heat index ranged from 100 to close to 110. The heat wave ended for some counties on the 21st due to a line of severe thunderstorms which roared through the area.
Clinton	7/30/2006	12:00 PM	Excessive Heat	N/A	0	0	0	0	Excessive heat returned to southern Illinois in late July and continued into early August. High temperatures were in the upper 90s to around 100 with the heat index ranging from 105 to 110.
Clinton	8/1/2006	12:00 AM	Excessive Heat	N/A	1	0	0	0	The late July Heat Wave continued into the first 2 days of August. Quincy, IL reached 100 on July 30, 101 on July 31, 99 on August 1, and 101 on August 2. Most other area were also around 100 degrees the first 2 days of August. One death, in Edwardsville in Madison County, was attributed to the heat. M80PH
Clinton	8/5/2007	12:00 PM	Excessive Heat	N/A	0	0	0K	0K	The first and only real Heat Wave of the summer began on August 4th and lasted through August 16th. High temperatures were consistently from the middle 90s to around 100 with the Heat Index from 105 to 110 degrees. Two deaths were reported in Madison County and one in St. Clair County. Two were found in homes that did not have air conditioning, and for the third the air conditioning was not working. Many schools across the area went to an early dismissal schedule in order to combat the heat.
Clinton	12/16/2000	8:00 PM	Extreme Windchill	N/A	1	0	0	0	A strong cold front moved across the area the afternoon of December 16 bringing in a blast of Arctic air. Temperatures by 900 pm on the 16th had dropped into the single digits with wind chill values down to 30 below zero. The wind chill remained from 20 below to 40 below zero through Noon on the 17th. An elderly man, from Springfield, IL, suffering from the early stages of Alzeimer's Disease, died in the cold. He left his home on the 16th, apparently become disoriented and headed south into Macoupin County. He was found in an open fiield on the 20th. M79OU

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Huey	11/14/1993	856	Flash Flood	N/A	0	0	50K	0	Flash flooding was reported along Highway 50 near Huey. Sections of Interstate 64 and Highway 177 were closed due to flooding across the extreme southwest section of the county.
Germantown	4/11/1994	745	Flash Flood	N/A	0	0	5K	0	Nearly three to four inches of rain fell over southwest sections of the county leading to flash flooding over several county roads.
Clinton	5/16/1995	800	Flash Flood	N/A	0	0	1K	0	Several small creeks rose out of their bank and flash flooded roads near Posey and Hoffman. Highways 127 and 161 were especially hard hit with several feet of water across sections of the road. Nearly all secondary and county roads had flash flooding and were closed at one point.
Clinton	5/17/1995	30	Flash Flood	N/A	0	0	0	0	Flash flooding was reported on Old Highway 50 two to three miles east of Trenton. Many secondary roads were closed due to flash flooding.
Clinton	4/28/1996	8:30 PM	Flash Flood	N/A	0	0	0	0	Rainfall of 4 to 6 inches caused flash flooding across Clinton County. Roads were impassable, including Highway 161 between New Baden and Albers.
Clinton	6/10/1996	8:00 PM	Flash Flood	N/A	0	0	500K	0	Up to five inches of rain fell from a nearly stationary thunderstorm on Clinton County, causing widespread flash flooding. Most of the damage occurred in Germantown, where residents had to be evacuated from flooded neighborhoods. At least 40 homes suffered water damage. The county was declared a state disaster area.
Clinton	6/24/2000	1:30 AM	Flash Flood	N/A	0	0	0	0	Rainfall of 3 to 5 inches caused widespread flash flooding. Most creeks in the area flooded closing numerous roads. Highway 50 and 161 in Clinton County had to be closed for a while. Non-paved rural roads were damaged by water runoff.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	5/12/2002	8:00 PM	Flash Flood	N/A	0	0	0	0	Water was everywhere as heavy rain fell on Mother's Day weekend. Rainfall of 3 to 6 inches hit the area causing widespread flash flooding. Virtually all creeks and streams flooded on Sunday into Monday, with flooding continuing into the week. In Calhoun County, the water had dropped a bit after early morning rain, but quickly rose again due to afternoon and evening rain. Bridges were washed out and mud slides in some areas closed roads. In Greene County, there was significant road damage due to washed out sections of roads and embankment slides. In St. Clair County, especially the Belleville area, flooded basements were a major problem as storm water drainage systems were overwhelmed. Route 177 east of Mascoutah was covered by water. In Monroe County, many county roads were reported underwater. Many county roads were also reported flooded in Clinton, Marion and Washington counties.
Carlyle	11/10/2002	12:10 PM	Flash Flood	N/A	0	0	0	0	Slow moving thunderstorms dumped several inches of rain on parts of Clinton County. The Clinton County Sheriff reported that Highways 50 and 161 near Carlyle were flooded.
East Central Portion	6/11/2003	8:00 PM	Flash Flood	N/A	0	0	0	0	Heavy rain caused flash flooding across parts of southwest Illinois. In St. Clair County, flooding was reported along Highway 4 in Lebanon and Mascoutah, along Highway 13 in Lenzberg, along Highway 159 in Smithton, and Highway 177 in Mascoutah. In Randolph County, flooding occurred along Highway 4 from Tilden to Sparta. In Clinton County, Highway 50 flooded near Aviston as did Highway 161 near Albers. In Washington County, Highway 15 flooded in the western part of the county.
Clinton	8/29/2003	11:00 AM	Flash Flood	N/A	0	0	0	0	Rainfall up to 4 inches caused scattered flash flooding across Clinton and Washington counties. Highway 50 near Carlyle was flooded in several locations. Highways 127 and 15 in Washington County were also reported flooded.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	5/27/2004	7:30 PM	Flash Flood	N/A	0	0	0	0	Rainfall of 2 to 4 inches caused flash flooding across the area. Flooding was reported in Fairview Heights, New Baden, Waterloo, and Salem.
Hoffman	6/26/2007	14:30 PM	Flash Flood	N/A	0	0	0K	0K	Local law enforcement reported Highway 161 flooded in several locations from Posey to Centralia.Heavy rainfall from the morning combined with thunderstorms during the afternoon to produce 2 - 4 inches of rain across eastern Clinton County.
Clinton	4/28/2002	1:18 AM	Flood	N/A	0	0	0	0	Heavy rain during the last week in April pushed the Kaskaskia River out of its banks. The flooding was relatively minor, but continued and worsened in May.
Clinton	5/1/2002	12:00 AM	Flood	N/A	0	0	0	0	Flooding continued along the Illinois River for the entire month due to several heavy rain events. Flooding ranged from about 10.5 to 14.5 feet over flood stage, making the flooding the worst in several years. Numerous roads along the river were closed for almost the entire month. However due to relocations after earlier floods, damage was primarily limited to farmland and club houses along the river.
Clinton	4/4/2007	3:00 AM	Frost/freeze	N/A	0	0	0K	0K	A hard freeze hit the St. Louis NWS County Warning Area April 4 - 10, 2007. In Illinois, crops hit hard include wheat, alfalfa, grapes, peaches, apples, and strawberries. Damage estimates across Illinois were not available.
Clinton	5/21/1957	1546	Hail	1.50 in.	0	0	0	0	None Reported
Clinton	5/24/1960	920	Hail	1.75 in.	0	0	0	0	None Reported
Clinton	8/3/1967	1945	Hail	3.00 in.	0	0	0	0	None Reported
Clinton	4/3/1974	1410	Hail	1.75 in.	0	0	0	0	None Reported
Clinton	9/6/1980	2033	Hail	0.75 in.	0	0	0	0	None Reported
Clinton	6/7/1982	1808	Hail	0.75 in.	0	0	0	0	None Reported
Clinton	9/6/1983	1700	Hail	1.75 in.	0	0	0	0	None Reported
Clinton	9/6/1983	1945	Hail	1.75 in.	0	0	0	0	None Reported
Clinton	3/10/1986	1120	Hail	0.75 in.	0	0	0	0	None Reported

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	4/7/1986	1615	Hail	0.75 in.	0	0	0	0	None Reported
Clinton	4/7/1986	1630	Hail	0.75 in.	0	0	0	0	None Reported
Clinton	6/2/1987	1600	Hail	1.75 in.	0	0	0	0	None Reported
Clinton	11/15/1989	515	Hail	1.00 in.	0	0	0	0	None Reported
Clinton	11/15/1989	615	Hail	1.75 in.	0	0	0	0	None Reported
Carlyle	5/18/1995	1225	Hail	1.75 in.	0	0	0	0	Golf ball-size hail was reported.
Farina	5/18/1995	1315	Hail	0.75 in.	0	0	0	0	Numerous barns in and around St. Rose sustained damage and grain bins were toppled over. Power lines were also knocked down with power outages in Trenton and New Baden.
Boulder	5/3/1996	5:00 PM	Hail	0.75 in.	0	0	0	0	Amateur radio spotters reported 3/4 inch hail.
Boulder	5/3/1996	5:05 PM	Hail	1.50 in.	0	0	0	0	Amateur radio spotters reported ping-pong ball size hail.
Trenton	5/21/1998	1:05 PM	Hail	1.00 in.	0	0	0	0	A storm spotter reported 1 inch hail.
St Rose	2/27/1999	1:00 PM	Hail	1.00 in.	0	0	0	0	Amateur radio spotters reported 1 inch hail.
Trenton	2/27/1999	1:05 PM	Hail	1.00 in.	0	0	0	0	The county sheriff reported 1 inch hail.
Keyesport	2/27/1999	1:15 PM	Hail	1.00 in.	0	0	0	0	Storm spotters reported 1 inch hail in Keyesport.
Posey	4/7/2000	2:05 PM	Hail	0.75 in.	0	0	0	0	Law enforcement personnel reported 3/4 inch hail near Posey.
Germantown	5/12/2000	6:40 PM	Hail	0.75 in.	0	0	0	0	Storm spotters reported 3/4 inch hail.
Stolletown	10/4/2000	3:15 PM	Hail	1.00 in.	0	0	0	30K	A severe thunderstorm caused wind and hail damage at a couple of farms north of Stolletown. A machine shed, silos and a couple of grain bins were destroyed at one farm. A couple of soybean fields were hard hit by the hail. Insurance adjusters estimated 80% of the crop to be destroyed. A lightning strike was blamed for the loss of a transformer, a pump motor, a computer and an answering machine.
Aviston	4/4/2003	3:55 PM	Hail	1.00 in.	0	0	0	0	The County Sheriff reported 1 inch hail.
Breese	3/20/2004	7:04 AM	Hail	0.75 in.	0	0	0	0	A storm spotter reported 3/4 inch hail.
Trenton	5/25/2004	2:25 PM	Hail	0.75 in.	0	0	0	0	Storm spotters reported 3/4 inch hail.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Breese	5/27/2004	6:50 PM	Hail	0.88 in.	0	0	0	0	Storm spotters reported nickel hail.
Breese	5/30/2004	3:30 PM	Hail	2.75 in.	0	0	0	0	Storm spotters reported baseball size hail west of Breese and golfball size hail in town.
Breese	5/30/2004	3:33 PM	Hail	1.75 in.	0	0	0	0	Storm spotters reported baseball size hail west of Breese and golfball size hail in town.
Albers	7/22/2004	3:30 PM	Hail	0.88 in.	0	0	0	0	Storm spotters reported nickel size hail just south of Albers.
Germantown	7/22/2004	4:28 PM	Hail	0.88 in.	0	0	0	0	Storm spotters reported nickel size hail south of Germantown.
Germantown	7/22/2004	5:43 PM	Hail	0.88 in.	0	0	0	0	A storm spotter reported nickel size hail and estimated 60 mph wind gusts
Carlyle	7/22/2004	5:52 PM	Hail	1.00 in.	0	0	0	0	A storm spotter reported 1 inch hail in Carlyle.
Aviston	3/31/2005	6:35 PM	Hail	0.88 in.	0	0	0	0	A storm spotter reported nickel size hail in Aviston.
Breese	3/31/2005	6:55 PM	Hail	1.25 in.	0	0	0	0	Amateur radio spotters reported 1 1/4 inch hail in Breese.
Breese	4/12/2005	12:37 PM	Hail	0.75 in.	0	0	0	0	None Reported
Breese	5/19/2005	10:25 PM	Hail	1.00 in.	0	0	0	0	Amateur radio spotters reported 1 inch hail north of Breese.
Bartelso	6/6/2005	12:45 PM	Hail	0.75 in.	0	0	0	0	Amateur radio spotters reported 3/4 inch hail.
Germantown	7/4/2005	2:40 PM	Hail	1.00 in.	0	0	0	0	An off duty National Weather Service employee reported trees and power lines down in Breese. Amateur radio spotters reported 1 inch hail in Germantown. In Albers, the local newspaper reported some downed trees and damaged road signs. At Eldon Hazlet State Park along Carlyle Lake, one camper was damaged by a downed tree.
Albers	11/5/2005	11:05 PM	Hail	1.00 in.	0	0	0	0	Storm spotters reported 1 inch hail.
Carlyle	4/7/2006	1:00 PM	Hail	1.00 in.	0	0	0	0	Hail up to 1 inch in diameter covered the ground in Bartelso and Carlyle. There were several auto accidents in Carlyle due to the hail.
Bartelso	4/7/2006	12:50 PM	Hail	0.88 in.	0	0	0	0	Hail up to 1 inch in diameter covered the ground in Bartelso and Carlyle. There were several auto accidents in Carlyle due to the hail.
New Memphis	4/30/2006	2:35 PM	Hail	0.75 in.	0	0	0	0	None Reported
New Memphis	4/30/2006	2:40 PM	Hail	1.00 in.	0	0	0	0	None Reported

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Carlyle	4/30/2006	3:15 PM	Hail	0.75 in.	0	0	0	0	None Reported
St Rose	5/24/2006	5:07 PM	Hail	1.75 in.	0	0	0	0	None Reported
Keyesport	5/24/2006	5:14 PM	Hail	1.00 in.	0	0	0	0	None Reported
Aviston	7/21/2006	10:50 AM	Hail	1.25 in.	0	0	0	0	None Reported
Germantown	7/21/2006	11:00 AM	Hail	0.88 in.	0	0	0	0	None Reported
Trenton	3/1/2007	9:20 AM	Hail	0.88 in.	0	0	0K	0K	A warm front extended from a strong surface low west of Columbia, Missouri to just south of St. Louis and across Southern Illinois. Unseasonably warm, moist, and unstable air was moving north towards central Missouri while cooler moist air was present north of the warm front. This helped to trigger severe thunderstorms along and north of the warm front, including a severe bow echo system. The storms began to develop during the evening hours of February 28th and persisted into the late morning hours of March 1st.
Beckemeyer	4/3/2007	12:15 PM	Hail	0.75 in.	0	0	0K	0K	A cold front moved through the region triggering severe thunderstorms. Numerous reports of hail were received.
Carlyle	4/3/2007	12:20 PM	Hail	0.88 in.	0	0	0K	0K	A cold front moved through the region triggering severe thunderstorms. Numerous reports of hail were received.
New Baden	8/24/2007	14:15 PM	Hail	1.00 in.	0	0	0K	0K	Isolated high precipitation supercells developed and moved through the region on August 24th. Damaging winds and large hail were associated with the severe storms.
Aviston	8/24/2007	14:23 PM	Hail	1.00 in.	0	0	0K	0K	Isolated high precipitation supercells developed and moved through the region on August 24th. Damaging winds and large hail were associated with the severe storms.
Aviston	8/24/2007	14:25 PM	Hail	1.00 in.	0	0	0K	0K	Isolated high precipitation supercells developed and moved through the region on August 24th. Damaging winds and large hail were associated with the severe storms.
Clinton	6/12/1994	0	Heat	N/A	0	10	0	0	South Central and Southwest Illinois,Most of the region had excessive heat for 12 straight days with highs over 90 and high relative humidities. This produced heat index values well over 100 degrees for several days. Numerous people were treated at area hospitals for heat stroke or exhaustion.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
West Central And	7/11/1995	1200	Heat	N/A	2	95	50K	0.2M	A very hot and humid airmass settled into the region on the 11th with nearly a week of high temperatures close to 100 degrees and heat indicies approaching 120 at times. Known deaths were in the metropolitan areas east of St.Louis, with most victims elderly and living alone. In St.Clair County, a 42-year-old man was found on the second floor of his Fairmont City apartment building. A 69-year-old man was also found in Swansea with no air conditioning and all windows closed in his apartment. Many roads through out the region also buckled from the extreme heat and crops withered with the dry weather. There was no widespread loss of livestock although dairy cows produced less milk, and cattle/swine/chickens put on less weight. M42PH, M69PH, F66PH, M83P, M75P.
West Central And	7/28/1995	1200	Heat	N/A	0	30	5K	10K	Another heat wave moved into the area with heat indicies at 110 for several days. Several people were treated in area hospitals for heat related illnesses, mainly across metropolitan areas just east of St.Louis. A heat wave developed during most of middle August with high temperatures near the 100 degree mark and heat indicies over 110. Two deaths were attributed to the heat in the St. Louis metro area, with many more people suffering from heat related illnesses. Area crops also suffered greatly from the hot and dry weather. M44P, F88P
Southwest And	8/9/1995	1300	Heat	N/A	2	97	0	0.2M	A heat wave developed during most of middle August with high temperatures near the 100 degree mark and heat indicies over 110. Two deaths were attributed to the heat in the St. Louis metro area, with many more people suffering from heat related illnesses. Area crops also suffered greatly from the hot and dry weather. M44P, F88P

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	11/17/2003	7:00 AM	Heavy Rain	N/A	0	0	0	0	Rainfall of 2 - 5 inches fell over a 12 to 24 hour period causing widespread flooding across Southwest Illinois. In the Metro East area across from St. Louis, flooded streets and highways were common. In Belleville, Richland Creek flooded filling the city's skateboard park with about 3 feet of water. Some local kayakers took advantage of the flooding and paddled around the park. Elsewhere in St. Clair County, Silver Creek flooded Route 177 in Mascoutah. Route 13 was also flooded in places. In Madison County, Route 4 was flooded in several locations near Edwardsville. In Macoupin County, Route 4 flooded near Benld and street flooding was reported in Bunker Hill. In Clinton County, water was reported to be 2 feet deep on some roads in Breese
Clinton	1/5/2005	10:00 AM	Heavy Rain	N/A	0	0	0	0	Rainfall of 3 to 6 inches over the past 4 to 5 days caused general flooding across the area. Many small streams and creeks flooded throughout the region. Numerous roads were flooded and were closed due to the flooded streams or excessive ponding of water from the rain.
Clinton	12/13/2000	6:00 AM	Heavy Snow	N/A	0	0	0	0	This first major winter storm of the season hit the region dropping from 6 to 10 inches of snow. Some schools in rural areas remained closed into the middle of next week as temperatures remained very cold and a couple of minor snowfalls kept traveling conditions poor.
Clinton	12/15/2007	6:00 AM	Heavy Snow	N/A	0	0	0K	0K	Snowfall up to 8 inches fell across southwest and south central Illinois. Travel was disrupted across the area through the weekend.
Clinton	1/31/2008	12:00 PM	Heavy Snow	N/A	0	0	0K	0K	A winter storm dropped up to 11 inches of snow across parts of East Central Missouri and Southwest Illinois. Light snow started on Thursday by midday, 1/31/2008, and continued through the day. Amounts were light into Thursday evening, generally from two to four inches. Late Thursday night into the early morning hours Friday, 2/1/2008, heavy snow developed with snow falling at the rate of two to three inches per hour.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	2/1/2008	12:00 AM	Heavy Snow	N/A	0	0	0K	0K	A winter storm dropped up to 11 inches of snow across parts of East Central Missouri and Southwest Illinois. Light snow started on Thursday by midday, 1/31/2008, and continued through the day. Amounts were light into Thursday evening, generally from two to four inches. Late Thursday night into the early morning hours Friday, 2/1/2008, heavy snow developed with snow falling at the rate of two to three inches per hour.
Clinton	9/26/1996	11:00 AM	High Wind	45 kts.	0	0	140K	5K	Winds gusting to around 50 mph accompanying a strong cold front caused scattered damage across the Metro-East area. Most damage was limited to trees and power lines, although a few homes were also damaged by falling trees or large limbs. An estimated 5000 residents lost power across the area. Some corn was also flattened in fields in Clinton County near St. Rose
Clinton	4/30/1997	1:00 PM	High Wind	45 kts.	0	0	0	0	West to northwest winds of 30 to 40 with gusts in excess of 50 blew in behind a cold front causing widespread damage. Most damage was limited to trees, powerlines, outbuildings, and signs. Some roofs lost shingles as well.
Clinton	3/13/2001	9:00 AM	High Wind	45 kts.	0	0	0	0	A strong low pressure system moving across the Great Lakes made for a windy day across the region. Winds were generally 20 to 40 mph with gusts from 40 to 50 mph. Scattered reports of tree, roof shingle and sign damage were common across the area.
Clinton	4/18/1995	930	High Winds	0 kts.	0	0	400K	0	West and Southwest Illinois A strong storm system that moved from the Plains across Iowa and into the Great Lakes brought strong gradient winds to parts of western and southwest Illinois. Winds were sustained between 30 and 40 mph most of the day with gusts to nearly 60 mph. Numerous trees and billboards were damaged or blown down. Many homes sustained minor damage, either to roofs, porches, or garages.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	1/13/1999	4:30 AM	Ice Storm	N/A	0	0	0	0	An ice storm struck the area leaving at least a 1/4 inch coating of ice. Some trees and power lines were downed, but overall damage was relatively minor. The major problem was the ice covered roads that made travel difficult to impossible. Area schools were closed through the end of the week.
Clinton	1/12/2007	22:00 PM	Ice Storm	N/A	0	0	0K	0K	An arctic boundary settled south of the area on the 12th and 13th of January bringing subfreezing temperatures to the northwestern half of the county warning area. Three rounds of precipitation occurred during this period, with the first being the most destructive of all. Significant tree and limb damage was reported as a result of this storm, together with widespread power outages. More than 100,000 homes and businesses lost power during this storm. Ice accumulations across Southwest Illinois were from 1/4 to 1/2 inch. West Central Illinois also received up to 1 1/2 inches of sleet. While not as devastating as the late November early December ice storm, it did cause significant problems across the area. By late Sunday night temperatures has risen and much of the ice had melted.
Stolletown	10/4/2000	3:15 PM	Lightning	N/A	0	0	10K	0	A severe thunderstorm caused wind and hail damage at a couple of farms north of Stolletown. A machine shed, silos and a couple of grain bins were destroyed at one farm. A couple of soybean fields were hard hit by the hail. Insurance adjusters estimated 80% of the crop to be destroyed. A lightning strike was blamed for the loss of a transformer, a pump motor, a computer and an answering machine.
Clinton	2/21/2008	4:00 AM	Sleet	N/A	0	0	0K	0K	Another winter storm dropped from one half to two inches of sleet across Southwest Illinois. Randolph County reported up to two inches of sleet while other areas received from one half inch to one inch. At least 100 auto accidents were reported across the area. Most areas schools were closed on the 21st and the 22nd.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Shattuc	8/3/2007	7:00 AM	Thunderstorm Wind	N/A	0	0	0K	0K	A microburst blew down a large oak tree onto the corner of a house, causing moderate damage. Also, several smaller evergreens and fruit trees were blown down as well. A nearby cornfield also sustained wind damage.Isolated showers and thunderstorms developed across the region during the morning hours. One thunderstorm became severe causing some wind damage to one farmstead.
Aviston	8/24/2007	14:15 PM	Thunderstorm Wind	N/A	0	0	0K	0K	Downburst winds caused damage in an area from just southwest of Aviston through Breese, Beckemeyer, Carlyle, across Carlyle Lake, and into Boulder. Numerous trees, tree limbs and power lines were blown down. Also, several fields of corn were flattened. Some homes sustained minor shingle damage in Aviston. No injuries were reported.Isolated high precipitation supercells developed and moved through the region on August 24th. Damaging winds and large hail were associated with the severe storms.
Carlyle	10/18/2007	19:00 PM	Thunderstorm Wind	N/A	0	0	0K	0K	A large tree was blown down south of Carlyle, blocking Illinois Route 127.A strong cold front moved across the region during the afternoon and evening hours on October 18th...triggering showers and thunderstorms.
Germantown	4/15/1994	505	Thunderstorm Winds	N/A	0	0	1K	0	Numerous large trees were blown down.
Hoffman	4/15/1994	515	Thunderstorm Winds	N/A	0	0	1K	0	Several large trees were blown down or damaged.
Trenton	4/26/1994	2130	Thunderstorm Winds	N/A	0	0	1K	0	The county sheriff office reported numerous large trees blown down.
Breese	5/16/1995	340	Thunderstorm Winds	N/A	0	0	1K	0	Strong thunderstorm winds blew debris into numerous windows.
Breese	5/16/1995	610	Thunderstorm Winds	N/A	0	0	0	0	A local newspaper reported wind gusts as high as 60 miles an hour. No damage was reported.
Breese	5/16/1995	2115	Thunderstorm Winds	N/A	0	0	0	0	The county sheriff reported power lines down.
Albers	5/18/1995	1210	Thunderstorm Winds	N/A	0	0	0K	0	Large trees were blown down along Highway 161. Reported by a local newspaper.
Hoffman	5/18/1995	1235	Thunderstorm Winds	N/A	0	0	3K	0	Minor structural damage was reported to some homes.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
St.rose	5/27/1995	1620	Thunderstorm Winds	N/A	0	0	246	0	Numerous barns in and around St. Rose sustained damage and grain bins were toppled over. Power lines were also knocked down with power outages in Trenton and New Baden.
Keyesport	6/20/1995	1830	Thunderstorm Winds	N/A	0	0	105	0	Roof sections from a home and garage were damaged with power lines down.
Clinton	2/25/1956	115	Tornado	F4	0	0	2.5M	0	None Reported
Clinton	4/5/1958	1448	Tornado	F3	0	0	250K	0	None Reported
Clinton	3/8/1964	1855	Tornado	F2	0	0	25K	0	None Reported
Clinton	12/21/1967	1015	Tornado	F2	0	0	2.5M	0	None Reported
Clinton	4/3/1968	1840	Tornado	F1	0	0	250K	0	None Reported
Clinton	4/18/1975	1800	Tornado	F1	0	0	250K	0	None Reported
Clinton	10/22/1979	700	Tornado	F1	0	0	25K	0	None Reported
Clinton	12/2/1982	2110	Tornado	F3	2	0	25.0M	0	None Reported
Clinton	11/26/1990	1935	Tornado	F0	0	0	25K	0	None Reported
Carlyle	6/16/2000	11:25 AM	Tornado	F0	0	0	0	0	A small tornado initially touched down north of Carlyle in the vicinity of the Fun Center on Highway 127. Supports on some of the equipment were ripped off and driven into the ground by the tornado. The tornado damaged 2 homes northeast of the Fun Center ripping off roof shingles and damaging the roof of a garage. A pole barn was also destroyed.
Bartelso	4/4/2003	4:08 PM	Tornado	F1	0	0	0	0	A tornado caused sporadic damage as it traveled through bottom land near the Kaskaskia River south and southeast of Bartelso. Two well built farm buildings were destroyed by the tornado, one south and the other southeast of Bartelso. Trees were also downed and mangled by the tornado.
Germantown	6/10/2003	5:30 PM	Tornado	F0	0	0	0	0	A tornado caused brief damage to a farmstead over south-central Clinton County Illinois. The tornado occurred 4 miles south of Germantown Illinois in the Santa Fe flood plain along and north of the Kaskaskia River. A barn, machine shed, and silo sustained the greatest degree of damage while there was minor damage to the farm home. Debris from the farmstead was thrown from 200 yards to 1.4 mile northeast. This tornado occurred approximately 2.0 miles to the east-northeast of another tornado that hit the area on April 4, 2003.
St Rose	5/19/2004	3:50 PM	Tornado	F0	0	0	0	0	Local law enforcement reported a brief tornado touchdown along Stolletown Road. No damage was reported.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Breese	5/30/2004	3:50 PM	Tornado	F1	0	0	0	0	A tornado formed at 4:50 pm CDT 3.5 miles northeast of Breese Illinois just northwest of the intersection of Stollentown Road and Old State Highway 21. The tornado damaged machine sheds, one home and other farm buildings 1/2 mile north of this intersection. Sheet metal from these buildings were tossed 1/4 to 1/3 mile to the northeast in an open field. The tornado continued to travel to the northeast and damaged several large trees northeast of the farmstead. Three other farmsteads were hit by this tornado approximately 3.5 to 4 miles north of Carlyle Illinois just north of the intersection of Highway 127 and Hazlet Park road. Sheet metal from the outbuildings were tossed 1/4 to 1/3 mile northeast of the farmsteads. A garage and 60 foot silo on one of the farmsteads was also damaged by the tornado. Total damage track of the Breese Illinois tornado was 7 miles while the damage width varied from 50 to 80 yards. Damage intensity was rated F1.
Albers	7/4/2005	2:20 PM	Tornado	F0	0	0	0	0	A small tornado formed on the west side of Albers and moved northeast to the north side of town. Numerous large trees were severely damaged from 1/4 mile west of the intersection of Jaycee Drive and Dwight Street through Albers Jaycee Park. Damage was rated F1 in this area. The tornado caused additional damage at another park east of the intersection of North Franklin and Apple Drive on the northern part of town. A few homes east of the park sustained minor siding and window damage.
Trenton	7/21/2006	10:45 AM	Tornado	F0	0	0	0	0	The tornado moved from St. Clair County to Clinton County west of Trenton and moved across the southern part of town. Trees and power lines were downed, and some minor roof damage occurred. Power was out in most of the town due to the tornado and thunderstorm winds for several days. Two grain silos were also destroyed in the south part of town.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Germantown	7/21/2006	10:55 AM	Tornado	F1	0	0	0	0	A tornado formed west of Germantown and totally destroyed a large poultry building and damaged two other buildings. Debris from the poultry building was thrown 1/2 mile to the east. The tornado also severed the tops of several trees in the south part of Germantown.
Clinton	5/21/1957	1546	Tstm Wind	65 kts.	0	0	0	0	None Reported
Clinton	7/19/1958	1945	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/19/1958	1945	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	11/16/1958	1525	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/31/1968	1640	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	6/1/1969	1215	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	6/22/1969	1937	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/3/1969	2000	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/3/1969	2000	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	4/3/1974	1410	Tstm Wind	65 kts.	0	0	0	0	None Reported
Clinton	6/9/1974	310	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/5/1975	2240	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	2/21/1976	248	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	3/4/1976	2115	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	3/29/1976	1750	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	10/22/1979	815	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	4/7/1980	2355	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	6/19/1980	1315	Tstm Wind	55 kts.	0	0	0	0	None Reported
Clinton	9/6/1980	2002	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	4/2/1982	2148	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	5/1/1983	2030	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	6/3/1983	210	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	8/5/1983	1550	Tstm Wind	60 kts.	0	0	0	0	None Reported
Clinton	3/15/1984	1908	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	3/15/1984	1910	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	3/15/1984	1930	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	8/8/1984	1500	Tstm Wind	52 kts.	0	0	0	0	None Reported
Clinton	4/5/1985	515	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	11/19/1985	1610	Tstm Wind	52 kts.	0	0	0	0	None Reported
Clinton	7/9/1986	1700	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/9/1986	1715	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/9/1986	1715	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/9/1986	1730	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/6/1987	1315	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/26/1987	1930	Tstm Wind	59 kts.	0	0	0	0	None Reported

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	5/9/1990	1930	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	5/15/1990	1705	Tstm Wind	56 kts.	0	0	0	0	None Reported
Clinton	5/15/1990	1725	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	8/8/1991	1625	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	11/29/1991	2250	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	4/16/1992	1520	Tstm Wind	0 kts.	0	0	0	0	None Reported
Clinton	7/4/1992	1835	Tstm Wind	70 kts.	0	0	0	0	None Reported
Bartelso	1/18/1996	10:10 AM	Tstm Wind	50 kts.	0	0	0	0	Thunderstorm wind gusts blew shingles off a roof.
Beckemeyer	5/25/1996	7:10 PM	Tstm Wind	55 kts.	0	0	5K	0	Thunderstorm wind gusts downed trees and power lines.
Carlyle	5/25/1996	7:15 PM	Tstm Wind	55 kts.	0	0	5K	0	Thunderstorm wind gusts downed trees and power lines.
Trenton	10/17/1996	4:25 PM	Tstm Wind	51 kts.	0	0	0	0	County sheriff reported trees down.
New Baden	6/21/1997	4:35 PM	Tstm Wind	52 kts.	0	0	0	0	County sheriff reported wind gusts at least 60 mph with power lines down.
Boulder	6/21/1997	4:45 PM	Tstm Wind	52 kts.	0	0	0	0	County sheriff reported power lines down in Boulder and near Carlyle Lake,
Germantown	6/21/1997	5:00 PM	Tstm Wind	52 kts.	0	0	0	0	County sheriff reported trees down on the east side of town.
Albers	7/14/1997	3:00 PM	Tstm Wind	50 kts.	0	0	0	0	The County Sheriff reported trees and power lines down in Albers.
Germantown	7/14/1997	3:10 PM	Tstm Wind	50 kts.	0	0	0	0	The County Sheriff reported trees and power lines down along Route 161 in the Germantown area.
Trenton	9/2/1997	4:30 PM	Tstm Wind	51 kts.	0	0	0	0	The County Sheriff reported a few trees and power lines down from thunderstorm wind gusts.
Trenton	5/23/1998	6:00 PM	Tstm Wind	55 kts.	0	0	0	0	The County Sheriff reported trees and powerlines down across parts of Clinton County, primarily in the Trenton and Breese areas.
Breese	5/23/1998	6:05 PM	Tstm Wind	55 kts.	0	0	0	0	The County Sheriff reported trees and powerlines down across parts of Clinton County, primarily in the Trenton and Breese areas.
New Memphis	6/12/1998	5:40 PM	Tstm Wind	57 kts.	0	0	0	0	The Clinton County Sheriff reported wind damage across parts of the county. A truck was blown off I-64 near New Memphis. Numerous trees and power lines were also downed.
Albers	6/12/1998	5:47 PM	Tstm Wind	57 kts.	0	0	0	0	The Clinton County Sheriff reported wind damage across parts of the county. A truck was blown off I-64 near New Memphis. Numerous trees and power lines were also downed.
Huey	6/12/1998	6:00 PM	Tstm Wind	57 kts.	0	0	0	0	The Clinton County Sheriff reported wind damage across parts of the county. A truck was blown off I-64 near New Memphis. Numerous trees and power lines were also downed.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Albers	6/18/1998	9:20 PM	Tstm Wind	60 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees and utility lines, primarily across the southern part of the county alone Highway 161.
Bartelso	6/18/1998	9:30 PM	Tstm Wind	60 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees and utility lines, primarily across the southern part of the county alone Highway 161.
Carlyle	6/18/1998	9:40 PM	Tstm Wind	60 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees and utility lines, primarily across the southern part of the county alone Highway 161.
Hoffman	6/18/1998	9:45 PM	Tstm Wind	60 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees and utility lines, primarily across the southern part of the county alone Highway 161.
New Memphis	6/20/1998	1:00 AM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts downed quite a few trees and some power lines along the Clinton/Washington County border, along the Kaskaskia River.
Germantown	5/17/1999	2:15 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts downed trees in Germantown. In Hoffman, 8 structures suffered some degree of damage. One home lost most of its roof with the debris then causing damage to another home. Another home lost part of its roof and several windows. Trees and power lines were also downed by the wind gusts.
Hoffman	5/17/1999	2:25 PM	Tstm Wind	55 kts.	0	0	75K	0	Thunderstorm wind gusts downed trees in Germantown. In Hoffman, 8 structures suffered some degree of damage. One home lost most of its roof with the debris then causing damage to another home. Another home lost part of its roof and several windows. Trees and power lines were also downed by the wind gusts.
Carlyle	6/4/1999	6:15 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts downed trees and power lines.
Trenton	6/4/1999	6:15 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts downed trees and power lines.
Breese	6/14/2000	11:45 AM	Tstm Wind	52 kts.	0	0	0	0	Storm spotters reported trees down blocking Highway 50 between Breese and Beckemeyer.
Breese	6/24/2000	2:45 PM	Tstm Wind	52 kts.	0	0	0	0	Amateur radio spotters reported trees down in Breese.
Carlyle	8/17/2000	7:45 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts blew down numerous trees and power lines.
Carlyle	8/17/2000	8:45 PM	Tstm Wind	60 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees and power lines. The roof of a barn and several outbuildings were damaged near Trenton.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Trenton	8/17/2000	8:50 PM	Tstm Wind	60 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees and power lines. The roof of a barn and several outbuildings were damaged near Trenton.
Stolletown	10/4/2000	3:15 PM	Tstm Wind	65 kts.	0	0	210K	0	A severe thunderstorm caused wind and hail damage at a couple of farms north of Stolletown. A machine shed, silos and a couple of grain bins were destroyed at one farm. A couple of soybean fields were hard hit by the hail. Insurance adjusters estimated 80% of the crop to be destroyed. A lightning strike was blamed for the loss of a transformer, a pump motor, a computer and an answering machine.
Aviston	8/18/2001	5:49 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees across the area. Streets were blocked by downed trees in Aviston and Breese. Power lines were also reported down.
Breese	8/18/2001	5:50 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees across the area. Streets were blocked by downed trees in Aviston and Breese. Power lines were also reported down.
Beckemeyer	8/18/2001	5:55 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts downed numerous trees across the area. Streets were blocked by downed trees in Aviston and Breese. Power lines were also reported down.
Trenton	8/24/2001	4:45 PM	Tstm Wind	57 kts.	0	0	0	0	None Reported
Aviston	8/24/2001	4:50 PM	Tstm Wind	57 kts.	0	0	0	0	Thunderstorm wind gusts caused damage in Trenton and Aviston. Trees and power lines were down and corn in a field was flattened by the wind.
New Baden	8/25/2001	3:39 PM	Tstm Wind	52 kts.	0	0	0	0	The Sheriff Department reported trees down in New Baden.
Breese	4/27/2002	10:00 PM	Tstm Wind	55 kts.	0	0	0	0	Storm spotters reported wind damage south of Breese. The tin roof was blown off a pole barn, a garage door and the siding on the garage was damaged, and some windows were broken.
Breese	5/9/2002	12:35 AM	Tstm Wind	60 kts.	0	0	0	0	Storm spotters and the County Sheriff reported scattered wind damage in the Breese area. Several farms had outbuildings that were damaged., such as damaged grain bins and roofs blown off of barns. One home suffered roof damage and a couple of other homes were damaged by falling trees.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Breese	5/9/2002	12:37 AM	Tstm Wind	60 kts.	0	0	0	0	Storm spotters and the County Sheriff reported scattered wind damage in the Breese area. Several farms had outbuildings that were damaged., such as damaged grain bins and roofs blown off of barns. One home suffered roof damage and a couple of other homes were damaged by falling trees.
Breese	5/9/2002	12:40 AM	Tstm Wind	60 kts.	0	0	0	0	Storm spotters and the County Sheriff reported scattered wind damage in the Breese area. Several farms had outbuildings that were damaged., such as damaged grain bins and roofs blown off of barns. One home suffered roof damage and a couple of other homes were damaged by falling trees.
Carlyle	5/9/2002	12:45 AM	Tstm Wind	60 kts.	0	0	0	0	Storm spotters reported the roof of a home along Highway 50 damaged by wind gusts.
Trenton	6/11/2002	3:55 PM	Tstm Wind	55 kts.	0	0	0	0	Storm spotters reported numerous large trees limbs and some power lines down.
Carlyle	6/11/2002	4:10 PM	Tstm Wind	55 kts.	0	0	0	0	The County Sheriff reported numerous trees and power lines down.
Trenton	7/22/2002	7:45 PM	Tstm Wind	55 kts.	0	0	0	0	Storm spotters reported several trees and power lines down in Trenton and Aviston.
Aviston	7/22/2002	7:50 PM	Tstm Wind	55 kts.	0	0	0	0	Storm spotters reported several trees and power lines down in Trenton and Aviston.
New Baden	6/10/2003	5:35 PM	Tstm Wind	70 kts.	0	0	0	0	Thunderstorm wind gusts downed trees and power lines across eastern Clinton County from New Baden to Clinton. In New baden advertising signs were damaged and the canopy at a gasoline station was damage.
Trenton	6/10/2003	5:35 PM	Tstm Wind	70 kts.	0	0	0	0	Thunderstorm wind gusts downed trees and power lines across eastern Clinton County from New Baden to Clinton. In New baden advertising signs were damaged and the canopy at a gasoline station was damage.
Breese	6/10/2003	5:45 PM	Tstm Wind	61 kts.	0	0	0	0	The Sheriff Department reported numerous trees and power lines down in and around Breese.
Trenton	7/18/2003	9:15 AM	Tstm Wind	58 kts.	0	0	0	0	The County Sheriff reported numerous trees and power lines down in and around Trenton.
Jamestown	5/30/2004	2:30 PM	Tstm Wind	55 kts.	0	0	0	0	Amateur radio spotters reported trees down west of Jamestown.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Trenton	5/30/2004	3:15 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts downed trees and powerlines. At least 2 homes, one on Jefferson Street and the other on East Fifth Street, sustained major damage when trees fell on them.
Breese	7/5/2004	8:10 PM	Tstm Wind	52 kts.	0	0	0	0	Local law enforcement reported trees down northeast of Breese in the Frogtown area.
Trenton	7/5/2004	8:40 AM	Tstm Wind	55 kts.	0	0	0	0	Local law enforcement reported trees and power lines down in Trenton, Bartelso and Germantown.
Bartelso	7/5/2004	8:50 AM	Tstm Wind	55 kts.	0	0	0	0	Local law enforcement reported trees and power lines down in Trenton, Bartelso and Germantown.
Germantown	7/5/2004	8:50 AM	Tstm Wind	55 kts.	0	0	0	0	Local law enforcement reported trees and power lines down in Trenton, Bartelso and Germantown.
Trenton	7/5/2004	8:55 PM	Tstm Wind	65 kts.	0	0	0	0	Local law enforcement reported trees and power lines down in Trenton, Aviston, Germantown, and Carlyle. Several trees fell on homes and automobiles in Trenton. In Germantown, a large tree limb was driven through the windshield of a car. Several downed trees in Germantown were over 40 feet tall.
Aviston	7/5/2004	9:00 PM	Tstm Wind	60 kts.	0	0	0	0	Local law enforcement reported trees and power lines down in Trenton, Aviston, Germantown, and Carlyle. Several trees fell on homes and automobiles in Trenton. In Germantown, a large tree limb was driven through the windshield of a car. Several downed trees in Germantown were over 40 feet tall.
Germantown	7/5/2004	9:10 PM	Tstm Wind	65 kts.	0	0	0	0	Local law enforcement reported trees and power lines down in Trenton, Aviston, Germantown, and Carlyle. Several trees fell on homes and automobiles in Trenton. In Germantown, a large tree limb was driven through the windshield of a car. Several downed trees in Germantown were over 40 feet tall.
Carlyle	7/5/2004	9:20 PM	Tstm Wind	60 kts.	0	0	0	0	Local law enforcement reported trees and power lines down in Trenton, Aviston, Germantown, and Carlyle. Several trees fell on homes and automobiles in Trenton. In Germantown, a large tree limb was driven through the windshield of a car. Several downed trees in Germantown were over 40 feet tall.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Germantown	7/22/2004	5:43 PM	Tstm Wind	51 kts.	0	0	0	0	A storm spotter reported nickel size hail and estimated 60 mph wind gusts
Hoffman	8/19/2004	4:55 PM	Tstm Wind	55 kts.	0	0	0	0	Local law enforcement reported some trees down east of Hoffman.
Breese	6/8/2005	3:55 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm winds ripped most of the roof shingles off a home in St. Rose. Near Breese, the metal roof of a building was blown off. Some of the debris fell on and damaged a car in the parking lot.
St Rose	6/8/2005	3:55 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm winds ripped most of the roof shingles off a home in St. Rose. Near Breese, the metal roof of a building was blown off. Some of the debris fell on and damaged a car in the parking lot.
Albers	7/4/2005	2:30 PM	Tstm Wind	55 kts.	0	0	0	0	An off duty National Weather Service employee reported trees and power lines down in Breese. Amateur radio spotters reported 1 inch hail in Germantown. In Albers, the local newspaper reported some downed trees and damaged road signs. At Eldon Hazlet State Park along Carlyle Lake, one camper was damaged by a downed tree.
Breese	7/4/2005	2:35 PM	Tstm Wind	55 kts.	0	0	0	0	An off duty National Weather Service employee reported trees and power lines down in Breese. Amateur radio spotters reported 1 inch hail in Germantown. In Albers, the local newspaper reported some downed trees and damaged road signs. At Eldon Hazlet State Park along Carlyle Lake, one camper was damaged by a downed tree.
Carlyle	7/4/2005	2:50 PM	Tstm Wind	55 kts.	0	0	0	0	An off duty National Weather Service employee reported trees and power lines down in Breese. Amateur radio spotters reported 1 inch hail in Germantown. In Albers, the local newspaper reported some downed trees and damaged road signs. At Eldon Hazlet State Park along Carlyle Lake, one camper was damaged by a downed tree.
Trenton	8/13/2005	4:20 PM	Tstm Wind	55 kts.	0	0	0	0	Amateur radio spotters reported a couple of large trees down in Trenton.
Shattuc	11/15/2005	2:05 PM	Tstm Wind	56 kts.	0	0	0	0	A NWS damage survey revealed large trees and tree branches down on the campus of Kaskaskia College.
Shattuc	2/16/2006	5:30 PM	Tstm Wind	52 kts.	0	0	0	0	The County Sheriff reported 2 trees down on old US-50.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Aviston	4/2/2006	4:35 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts blew off roof shingles and caused tree damage on the northwest side of Aviston. In Breese, a warehouse lost its roof, numerous homes lost roof shingles and several trees were down. Some trees were also down in Posey.
Breese	4/2/2006	4:40 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts blew off roof shingles and caused tree damage on the northwest side of Aviston. In Breese, a warehouse lost its roof, numerous homes lost roof shingles and several trees were down. Some trees were also down in Posey.
Posey	4/2/2006	4:50 PM	Tstm Wind	55 kts.	0	0	0	0	Thunderstorm wind gusts blew off roof shingles and caused tree damage on the northwest side of Aviston. In Breese, a warehouse lost its roof, numerous homes lost roof shingles and several trees were down. Some trees were also down in Posey.
Trenton	7/21/2006	10:49 AM	Tstm Wind	65 kts.	0	0	0	0	Downburst winds caused a swath of damage between Trenton and New Baden towards the east to Albers and Germantown. One and a half miles southeast of Trenton, a silo, two machine sheds and a home on a farmstead sustained minor to moderate damage. Along this swath of downburst winds, numerous trees, tree limbs and hundreds of acres of corn were blown down. Another machine shed was damaged near the intersection of Albers Road and Highline Road, while a second machine shed was damaged 3 miles west of Germantown.
Aviston	7/21/2006	10:50 AM	Tstm Wind	61 kts.	0	0	0	0	Several telephone poles were broken. Also, numerous trees, tree limbs and power lines were blown down.
Germantown	7/21/2006	10:55 AM	Tstm Wind	60 kts.	0	0	0	0	Several trees were blown down, blocking Illinois Route 161 southeast of Germantown.
Bartelso	7/21/2006	11:05 AM	Tstm Wind	65 kts.	0	0	0	0	Another swath of downburst winds caused crop and tree damage from Bartelso to the Clinton/Washington County line. Some of the fallen trees caused minor to moderate damage to several homes in Bartelso. Also, two silos south of Bartelso were damaged.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	11/25/1996	2:00 PM	Winter Storm	N/A	0	0	0	0	Light freezing rain developed during the late afternoon and continued into the evening. Numerous accidents occurred on slick roads and downed power lines were scattered throughout the area.
Clinton	1/8/1997	6:00 PM	Winter Storm	N/A	0	0	0	0	A widespread winter storm affected the area from late afternoon on the 8th through the night of the 9th. Snow fall across the area was mostly in the 5 to 8 inch range. Strong winds and very cold temperatures moved in on the evening of the 9th creating more problems. The winds caused drifting snow and very cold wind chills. Schools remained closed for several days.
Clinton	1/15/1997	11:00 PM	Winter Storm	N/A	0	0	0	0	Freezing rain and sleet began falling late on the night of the 15th coating the area with a layer of ice by the morning rush. Numerous auto accidents occurred along with some power outages, and most area school were closed. Snow began by mid-morning of the 16th with 3 to 7 inches covering the area.
Clinton	1/12/1998	2:00 AM	Winter Storm	N/A	0	0	0	0	Freezing drizzle put a thin coating of ice on area roads causing widespread early morning travel problems. The hardest hit areas were just north of the St. Louis Metro area, including parts of Madison, Calhoun, and Jersey counties.
Clinton	12/21/1998	12:00 AM	Winter Storm	N/A	0	0	0	0	Winter came in with a vengeance, appropriately enough, on the 1st day of winter across west and southwest Illinois. A strong cold front brought the first blast of Arctic air to the state. This was quite a shock for many people as temperatures previously in the month had been quite mild, with highs ranging from the 50s to the 70s. Light freezing drizzle, sleet and snow came in with the cold front. Roads across much of the area became covered with a thin coating of ice by the morning rush hour on the 21st. Automobile accidents were numerous. Temperatures the night/morning of the 21st/22nd dropped into the single digits in most areas and only rose into the teens on the 22nd.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	1/1/1999	6:00 PM	Winter Storm	N/A	0	0	0	0	The new year started with a vengeance weather wise as a major winter storm hit the area. A combination of snow, sleet and freezing rain left from about 4 inches of frozen precipitation on the ground across the area. Transportation across the area came to a stop for much of the holiday weekend. Very cold temperatures after the storm kept conditions icy into next week, keeping most area schools closed through the middle of the week.
Clinton	1/28/2000	6:00 PM	Winter Storm	N/A	0	0	0	0	A steady light snow produced the first significant snow accumulation of the 1999-2000 winter season. Accumulations ranged from 3 to 5 inches.
Clinton	3/11/2000	5:00 AM	Winter Storm	N/A	0	0	0	0	A late season snow fell across southwest Illinois with snow depths ranging from 3 to 10 inches. Thunderstorms occurred with the snow causing the wide range of depths reported. The following snow depths were reported by county: Montgomery 3, Monroe 4, Madison 4, Bond 4, Jersey 4-6, Clinton 6, Fayette 6, Randolph 6, Washington 6, Calhoun 6-10, Greene 6-10, and Marion with 10. By mid-afternoon the snow was already melting, and by Sunday afternoon it was virtually gone.
Clinton	1/26/2001	1:00 AM	Winter Storm	N/A	0	0	0	0	Light rain began falling during the early morning hours of January 26 resulting in a thin coating of ice on area roads by the morning drive time. Most schools across the area were closed and numerous traffic accidents were reported. By mid-morning temperatures had risen above freezing and the ice was gone.
Clinton	12/4/2002	6:00 AM	Winter Storm	N/A	0	0	0	0	It was a commuter's nightmare as the first winter storm of the season hit parts of Southwest Illinois. With temperatures in the middle 20's, the light snow immediately stuck to area roads as it started to fall around 6 am creating very slick conditions. With roads becoming crowded with people heading to work, the highway and road crews could not make much headway in terms of plowing or spreading salt. Traffic in the St. Louis Metropolitan area crawled along throughout the day. Area school busses were running up to 2

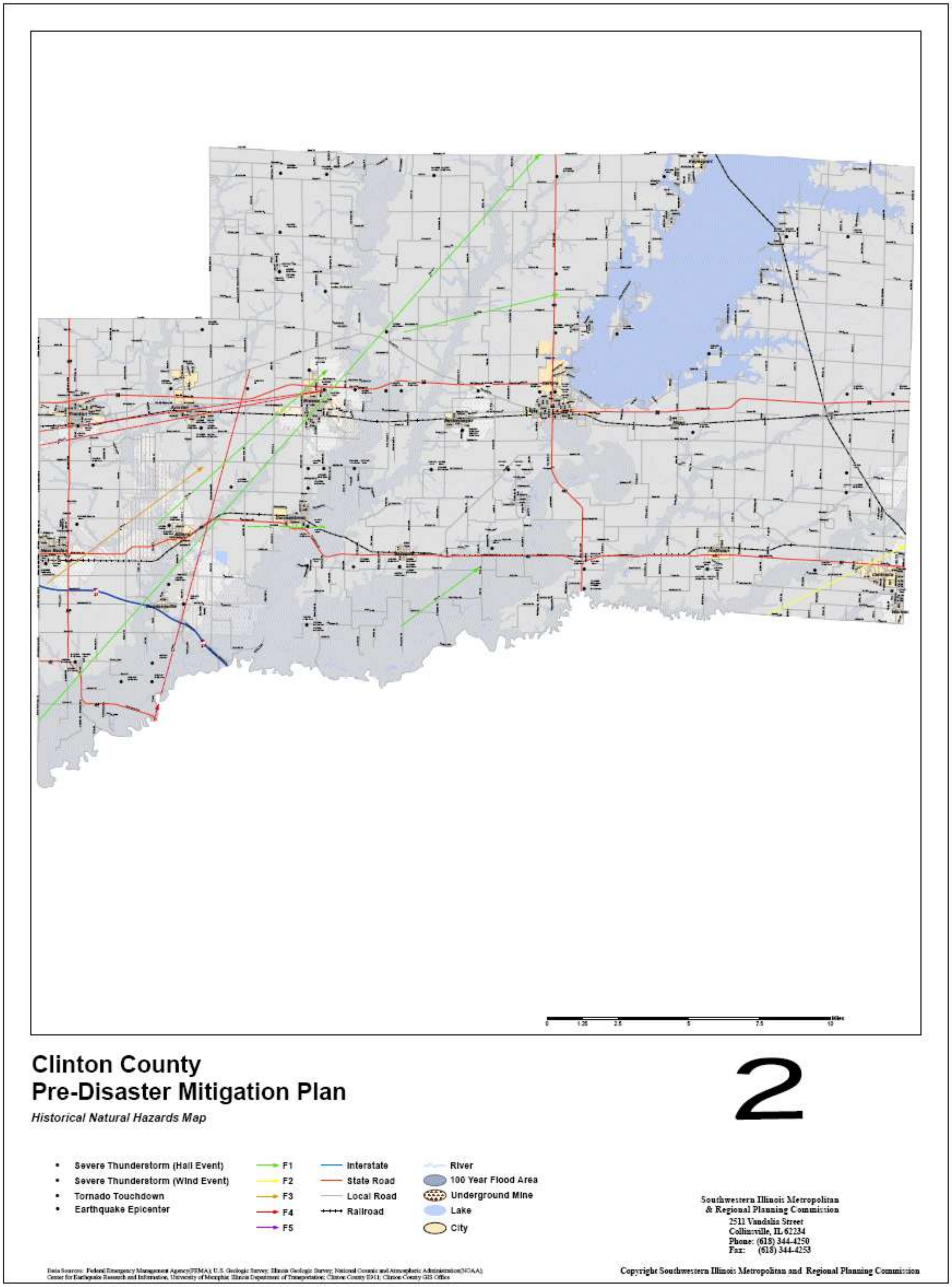
Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									hours late in getting children to school. In some areas, accident reports were coming in at the rate of 30 to 40 an hour. Snowfall across the region ranged from 2 to 5 inches.
Clinton	12/24/2002	6:00 AM	Winter Storm	N/A	0	0	0	0	A Christmas Eve snowstorm hit parts of Southwest Illinois. Snowfall across the region ranged from 7 to 10 inches. While area children loved the Christmas snow, area adults had to deal with very difficult travel conditions. Many people had to stay home instead of visiting family and friends.
Clinton	2/15/2003	1:00 PM	Winter Storm	N/A	0	0	0	0	A winter storm struck Valentine's Day weekend across parts of Southwest Illinois. About 1 inch of freezing rain and sleet fell initially followed by 4 - 7 inches of snow.
Clinton	2/23/2003	5:00 PM	Winter Storm	N/A	0	0	0	0	Another winter storm produced snow across Southwest Illinois. Around 3 inches fell across the northern counties of the area with amounts near 6 inches across the south.
Clinton	1/25/2004	6:00 AM	Winter Storm	N/A	0	0	0	0	A combination of freezing rain, sleet and snow fell bringing the region to a standstill. The event started with a period of freezing rain early Sunday morning. Some places received 1/4 to 1/.2 inch of freezing rain. The freezing rain changed to sleet by mid-morning with some locations in Southwest Illinois receiving 1 to 2 inches of sleet. By afternoon, the sleet changed to snow and accumulated another 1 to 2 inches. Luckily it was a Sunday, as transportation was brought to a halt across the region. Many schools across the region were closed into mid-week as another fast moving storm brought another inch or two of snow Monday night and early Tuesday.
Clinton	12/22/2004	12:00 PM	Winter Storm	N/A	0	0	0	0	Parts of Southwest Illinois had a white Christmas as a storm brought 3 - 5 inches of snow to the area.
Clinton	12/8/2005	10:00 AM	Winter Storm	N/A	0	0	0	0	The first significant winter storm of the season fell across the area bringing 2 to 5 inches of snow. West Central Illinois received from 2 - 5 inches of snow while Southwest and South Central Illinois saw 2 - 4 inches. There was one death related to the snowfall. An 88 year-old woman was found dead in her home after suffering a hear attack. Neighbors had seen her outside earlier shoveling snow.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
Clinton	11/30/2006	16:00 PM	Winter Storm	N/A	0	0	0K	0K	A major winter storm hit Western and Southern Illinois from November 30 through December 1, 2006. Up to a foot of snow fell across West Central Illinois while up to an inch of ice and sleet accumulated across Southwest Illinois, including the St. Louis area. Up to 300,000 customers lost electric service across Southwest and Southern Illinois due to downed power lines. In some areas it took a week to get the power restored. Many rural schools were closed for several days due to slick roads and power outages. Numerous buildings and automobiles were damaged by fallings trees and tree limbs. Damages will likely approach $100 million. Following is a short summary of how the storm affected various counties. Bond County: A tree fell on a car causing minor injuries to the driver. At least half of Greenville, IL lost power during the storm. Madison County: At least 75% of Edwardsville, IL lost power due to the storm. Numerous roofs and automobiles were damaged by falling tree limbs. There was one death due to an auto accident and another person died from carbon monoxide poisoning. Fumes from a generator running in a garage entered the home, killing one resident and seriously injuring another. Macoupin County: Emergency Management officials estimated that at least 40,000 of the 50,000 residents lost power during the storm. The southern 1/4 of the county was especially hard hit with most towns from Brighton to Bunker Hill to Staunton losing virtually all power. Monroe County: 142 residents of a nursing home had to be moved to another facility due to power problems. The small town of Maeystown lost all power and 66% of Waterloo lost power. Montgomery County: Emergency Management officials reported that 1 in 4 residents lost power from the storm. Pike County: One person was injured in an auto accident during the storm. The County Health Department in Pittsfield had to be closed because of a sagging roof the result of over a

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									foot of snow. St. Clair County: It was reported that 70% of the town of Mascoutah lost power from the storm. At least half of the residents in the Millstadt/Smithson area lost power. Roofs and autos were damaged due to falling tree limbs across East St. Louis, Alton, and Cahokia. One person was injured in an auto accident in Alton.
Clinton	12/1/2006	12:00 AM	Winter Storm	N/A	0	0	0K	0K	A major winter storm hit Western and Southern Illinois from November 30 through December 1, 2006. Up to a foot of snow fell across West Central Illinois while up to an inch of ice and sleet accumulated across Southwest Illinois, including the St. Louis area. Up to 300,000 customers lost electric service across Southwest and Southern Illinois due to downed power lines. In some areas it took a week to get the power restored. Many rural schools were closed for several days due to slick roads and power outages. Numerous buildings and automobiles were damaged by fallings trees and tree limbs. Damages will likely approach $100 million. Following is a short summary of how the storm affected various counties. Bond County: A tree fell on a car causing minor injuries to the driver. At least half of Greenville, IL lost power during the storm. Madison County: At least 75% of Edwardsville, IL lost power due to the storm. Numerous roofs and automobiles were damaged by falling tree limbs. There was one death due to an auto accident and another person died from carbon monoxide poisoning. Fumes from a generator running in a garage entered the home, killing one resident and seriously injuring another. Macoupin County: Emergency Management officials estimated that at least 40,000 of the 50,000 residents lost power during the storm. The southern 1/4 of the county was especially hard hit with most towns from Brighton to Bunker Hill to Staunton losing virtually all power.

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD	Description
									Monroe County:142 residents of a nursing home had to be moved to another facility due to power problems. The small town of Maeystown lost all power and 66% of Waterloo lost power. Montgomery County: Emergency Management officials reported that 1 in 4 residents lost power from the storm. Pike County: One person was injured in an auto accident during the storm. The County Health Department in Pittsfield had to be closed because of a sagging roof the result of over a foot of snow. St. Clair County: It was reported that 70% of the town of Mascoutah lost power from the storm. At least half of the residents in the Millstadt/Smithson area lost power. Roofs and autos were damaged due to falling tree limbs across East St. Louis, Alton, and Cahokia. One person was injured in an auto accident in Alton. The damage figures for the various counties is for public assistance only.
Clinton	12/8/2007	21:00 PM	Winter Weather	N/A	0	0	0K	0K	Light freezing rain and sleet fell across southwest and south central Illinois the weekend of December 8th into the early part of the next week. From 1/8 to 1/4 inch of ice accumulated along with light amounts of sleet. Travel was disrupted across the area, but overall the region fared well with little damage and few power outages reported.
Clinton	2/11/2008	10:00 AM	Winter Weather	N/A	0	0	0K	0K	Light freezing rain and sleet fell during the morning hours of February 11, 2008 resulting in numerous auto accidents and schools closing early. Three injuries were reported in accidents in Clinton County.
TOTALS:					**18**	**351**	**32.287 M**	**445K**	

Appendix E—Hazard Map



Appendix F—Complete List of Critical Facilities

BUS FACILITIES REPORT

ID	NAME	ADDRESS	CITY	CLASS	OWNER
1	Beck Bus Transportation	640 W Noleman	Centralia	BDFLT	
2	Carlyle Unit Dist #`	100 13th St	Carlyle	BDFLT	
3	Varel Bus Lines	205 Wilshire Dr	Bartelso	BDFLT	
4	Wesclin Unit Dist #3	10003 St RT 160	Trenton	BDFLT	
5	Breese Elementary Dist	777 Memorial Dr	Breese	BDFLT	
6	St. Rose Elementary Dist	18004 St. Rose Rd	St. Rose	BDFLT	
7	Aviston Elementary Dist	350 S. Hull St.	Aviston	BDFLT	
8	Germantown Elementary	401 Walnut PO Box 400	Germantown	BDFLT	
9	Damiansville Elem Dist #2	101 E Main St.	Damiansville	BDFLT	
10	Mater Dei High School	900 N Mater Dei Dr.	Breese	BDFL	

COMMUNICATIONS FACILITIES REPORT

ID	NAME	ADDRESS	CITY	CLASS	OWNER
1	WPUJ307		BREESE	CDFLT	BREESE, CITY OF
2	WNKB206	1100 N 7TH	BREESE	CDFLT	Breese Elementary
3	WNKB206	LOUIS ST	Beckemeyer	CDFLT	Breese Elementary
4	KSG450	290 N CLINTON	BREESE	CDFLT	Breese Fire
5	WNUN392	3/4 MI S OF US RT 50 ON GERMANTOWN Rd	BREESE	CDFLT	Breese Township
6	WNUN392		BREESE	CDFLT	Breese Township
7	KA79895			CDFLT	Breese Township
8	KZV231	500 N FIRST ST	BREESE	CDFLT	BREESE, CITY OF
9	WNKR307	.2 M E & 400FT S OF FAP 409 & WALNUT	BREESE	CDFLT	BREESE, CITY OF
10	WNQJ327	800 N 1ST ST.	BREESE	CDFLT	BREESE, CITY OF
11	WNQJ327		BREESE	CDFLT	BREESE, CITY OF
12	WNWB919	BWTP N FIRST ST	BREESE	CDFLT	BREESE, CITY OF
13	WNWB919	1/4 MI S OF RT 50 E ALONG SHOAL CREEK	BREESE	CDFLT	BREESE, CITY OF
14	WNWB919	1/2 MI N OF RT 50 E ALONG SHOAL CREEK	BREESE	CDFLT	BREESE, CITY OF
15	WPQS236		BREESE	CDFLT	BREESE, CITY OF
16	WNLB521	RT 1 BOX 114 1 3/4 MI N OF RT 50	SHATTUC	CDFLT	BRINK BROS
17	WNLB521		SHATTUC	CDFLT	BRINK BROS
18	KDG411	CNTY COURT HOUSE	CARLYLE	CDFLT	CARLYLE FIRE
19	KDG411	470 N 11TH ST FIRE STA	CARLYLE	CDFLT	CARLYLE FIRE
20	WPGK707	18106 WATER TOWER RD	CARLYLE	CDFLT	CARLYLE N WATER
21	WNFV434	SE & NE 1/4 SEC25 T2N R3W 3RD PM	CARLYLE	CDFLT	CARLYLE S W
22	KB33137		CARLYLE	CDFLT	CARLYLE, CITY OF
23	KNDS837	850 FRANKLIN ST	CARLYLE	CDFLT	CARLYLE, CITY OF
24	KNDS837		CARLYLE	CDFLT	CARLYLE, CITY OF
25	KNEJ565	850 FRANKLIN	CARLYLE	CDFLT	CARLYLE, CITY OF
26	KNEJ565		CARLYLE	CDFLT	CARLYLE, CITY OF
27	KNIQ489	850 FRANKLIN	CARLYLE	CDFLT	CARLYLE, CITY OF
28	KNIQ489		CARLYLE	CDFLT	CARLYLE, CITY OF
29	KZR654	850 FRANKLIN AVE	CARLYLE	CDFLT	CARLYLE, CITY OF
30	WNNE268	850 FRANKLIN ST	CARLYLE	CDFLT	CARLYLE, CITY OF
31	WPHD642			CDFLT	CARLYLE, CITY OF
32	WPMY372			CDFLT	CARLYLE, CITY OF
33	KBH281	CR 1.25 MI N	SHATTUC	CDFLT	CENTERPOINT
34	WNEM581	SHATTUC STA 1.5 MI SW OF	SHATTUC	CDFLT	CENTERPOINT

ID	NAME	ADDRESS	CITY	CLASS	OWNER
35	WNTB902	SHATTUC TOWER 1.2 MI N OF	SHATTUC	CDFLT	CENTERPOINT
36	WQGW688	Shattuc Twr 1.9 KM N	SHATTUC	CDFLT	CENTERPOINT
37	WQGW688		SHATTUC	CDFLT	CENTERPOINT
38	WNTJ263	SHATTUC TWR 1.9 KM N	SHATTUC	CDFLT	CENTERPOINT
39	WNEM581	SHATTUC STA 1.5 MI SW OF	SHATTUC	CDFLT	CENTERPOINT
40	WQAB729	WQAB729	CARLYLE	CDFLT	CKE
41	WNIJ250	.3 MI W INT RT 161 & AVISTON ALBERS RD	ALBERS	CDFLT	CLIN CLAIR FIRE
42	WNIJ250		ALBERS	CDFLT	CLIN CLAIR FIRE
43	WPHW580	19185 ST HWY 161	CARLYLE	CDFLT	CLIN WASH AG
44	WPHW580		CARLYLE	CDFLT	CLIN WASH AG
45	WGZ978	BECKEMEYER SUBSTATION STA 11 1.6 KM	BECKEMEYER	CDFLT	CLINTON CO ELE
46	WGZ978	SHATTUC SUBSTATION STA 10 5.6 KM S	SHATTUC	CDFLT	CLINTON CO ELE
47	WGZ978	BECKEMEYER SUBSTATION STA 11 1.6 KM	SHATTUC	CDFLT	CLINTON CO ELE
48	WGZ978	KEYESPORT SUBSTATION 171 1.6 KM S	MARYDA	CDFLT	CLINTON CO ELE
49	WGZ978	FERRIN SUBSTATION 9 4.02 KM SW	FERRIN	CDFLT	CLINTON CO ELE
50	WNPD728	ALBERS SUBSTATION 14 3.2 KM SE	TRENTON	CDFLT	CLINTON CO ELE
51	WNPD728	12.4 KM NE	TRENTON	CDFLT	CLINTON CO ELE
52	WNPD728	BREESE SUBSTATION 13 4.8 KM SW	BREESE	CDFLT	CLINTON CO ELE
53	WNPD728	BREESE OFC STA 7 475 N MAIN ST	BREESE	CDFLT	CLINTON CO ELE
54	WNPD728	BARTELSO SUBSTATION STA 12 1.6 KM	BARTELSO	CDFLT	CLINTON CO ELE
55	WPTL203	500 N FIRST ST	BREESE	CDFLT	CLINTON CO EME
56	WPTL203	80 LAKE RD	CARLYLE	CDFLT	CLINTON CO EME
57	WPTL203	810 FRANKLIN ST	CARLYLE	CDFLT	CLINTON CO EME
58	WPTL203		BREESE	CDFLT	CLINTON CO EME
59	KAU324	431 21ST ST	CARLYLE	CDFLT	CLINTON COUNTY
60	KAU324		CARLYLE	CDFLT	CLINTON COUNTY
61	KNIL659		CARLYLE	CDFLT	CLINTON COUNTY
62	KNIL659		CARLYLE	CDFLT	CLINTON COUNTY
63	KSA936	CLINTON CTY COURTHOUSE	CARLYLE	CDFLT	CLINTON COUNTY
64	KSA936		CARLYLE	CDFLT	CLINTON COUNTY
65	KSA936		CARLYLE	CDFLT	CLINTON COUNTY
66	WXP628	810 FRANKLIN ST	CARLYLE	CDFLT	CLINTON COUNTY
67	WPYT638	27210 COLLEGE RD	CENTRALIA	CDFLT	COMM COLLEGE
68	KNBQ250	1091 METHODIST ST	CARLYLE	CDFLT	CONSOLIDATED
69	KNBQ250		CARLYLE	CDFLT	CONSOLIDATED
70	KSC340	JOLIFF BRIDGE RD 1.4 N & 1.5 MI N	CENTRALIA	CDFLT	COUNTRYMARK
71	WPNU664	2.3 MI W & 0.8 KM N OF JOLIFF BRIDGE RD	CENTRALIA	CDFLT	COUNTRYMARK
72	KJE288	RR AND MAIN ST	BREESE	CDFLT	CSX TRAN INC
73	KNJN980	RR MP 288	HUEY	CDFLT	CSX TRAN INC
74	KNNP654	12706 DRIVE INN RD	BREESE	CDFLT	CSX TRAN INC
75	WNBV250	SIGNAL TWR RR CROSSING OF BN RR	SHATTUC	CDFLT	CSX TRAN INC
76	WXY328	RR DEPOT 850 WASHINGTON ST	CARLYLE	CDFLT	CSX TRAN INC
77	WXY328		CARLYLE	CDFLT	CSX TRAN INC
78	KNKA234	2.3 MI W & 0.8 KM N OF JOLIFF BRIDGE RD	BREESE	CDFLT	CYBERTEL CELL
79	KNKA234	1.1 MILES NNE OF SHATTUC ON OLD HW	SHATTUC	CDFLT	CYBERTEL CELL
80	KNKA234	S SIDE OF HW 50, 1.7 MILES E OF HW 127	CARLYLE	CDFLT	CYBERTEL CELL
81	KNKA234	RR1, Box 23	BREESE	CDFLT	CYBERTEL CELL
82	KNKA234	Route 50 West	SHATTUC	CDFLT	CYBERTEL CELL
83	KNKA234	400 West Matthew St.	CARLYLE	CDFLT	CYBERTEL CELL
84	WST981	2 KM N CTR	HOFFMAN	CDFLT	DON ANDERSON
85	WST981	1 KM N OF RT 161	HOFFMAN	CDFLT	DON ANDERSON
86	WST981	1 KM N CTR	HOFFMAN	CDFLT	DON ANDERSON
87	WST981		HOFFMAN	CDFLT	DON ANDERSON
88	KIU939	11929 LITTLE PRAIRIE RD	BREESE	CDFLT	DURHAM SCHOOL

ID	NAME	ADDRESS	CITY	CLASS	OWNER
89	KIU939		BREESE	CDFLT	DURHAM SCHOOL
90	KNCK926	EXXON MONTEREY MINE 2 3 MI E	ALBERS	CDFLT	EXXON COMM COMP
91	WNSO566	EXXON MONTEREY MINE 2 3 MI E	ALBERS	CDFLT	EXXON COMM COMP
92	WNYE246	EXXON MONTEREY MINE 2 3 MI E	ALBERS	CDFLT	EXXON COMM COMP
93	WNYE246		ALBERS	CDFLT	EXXON COMM COMP
94	WPSQ997	1/2 Mi SE	TRENTON	CDFLT	FIRST STUDENT
95	WPSQ997		TRENTON	CDFLT	FIRST STUDENT
96	WQCA516	1/2 mile SE	TRENTON	CDFLT	FIRST STUDENT
97	WQCA516		TRENTON	CDFLT	FIRST STUDENT
98	WXG480	.25 MI W OF RT 160 S	NEW	CDFLT	FRERKING, DENNIS
99	WPVR421	9504 BARTELSO ROAD	BARTELSO	CDFLT	G & S FARMS INC.
100	WPVR421		BARTELSO	CDFLT	G & S FARMS INC.
101	WPXF236		SHATTUC	CDFLT	GEIGER, MARK A
102	WNLA568	JOLLIFF BRIDGE RD	CENTRALIA	CDFLT	GENERAL
103	WNLA568		CENTRALIA	CDFLT	GENERAL
104	WPEE307			CDFLT	GENERAL
105	WPRK644	11543 PIPELINE ROAD	BARTELSO	CDFLT	GEORGE MEYER
106	WPRK644	15115 FROGTOWN ROAD	BECKEMEYER	CDFLT	GEORGE MEYER
107	WPRK644		BARTELSO	CDFLT	GEORGE MEYER
108	WPRK644		BECKEMEYER	CDFLT	GEORGE MEYER
109	WPYG430		GERMANTOWN	CDFLT	GERMANTOWN EGG CO
110	WPYG430		GERMANTOWN	CDFLT	GERMANTOWN EGG CO
111	KSE495		GERMANTOWN	CDFLT	GERMANTOWN
112	WPIC486	1ST & OAK ST	HOFFMAN		AGRIPRIDE FS INC
113	WPIC486	N MINE RD	BREESE		AGRIPRIDE FS INC
114	WPIC486		HOFFMAN		AGRIPRIDE FS INC
115	WPIC486		BREESE		AGRIPRIDE FS INC
116	WPUI867	206 N BROADWAY	ALBERS		ALBERS ELE
117	WPIG265	S COMMERCIAL ST 1 BLK S OF RT 161	ALBERS		AMEREN SERVICES
118	KNKS240	2.9 MI N OF CITY CENTER	BREESE		AMEN MESSAG
119	WPMG268	HWY 50 E	BREESE		ARROW GROUP
120	WPMG268		BREESE		ARROW GROUP
121	WQFL925		AVISTON		AVISTON SCHOOL
122	KNBZ650	51 S SPRING	AVISTON		AVISTON FIRE
123	KNBZ650		AVISTON		AVISTON FIRE
124	WQGB731	450 WEST RAILROAD	AVISTON		AVISTON FIRE
125	WQGB731		AVISTON		AVISTON FIRE
126	KFQ693	RT 160 & 161	NEW BADEN		AVISTON LUMBER
127	WPWA772	99 WEST FIRST STREET	AVISTON		AVISTON, VILLAGE
128	WPWA772		AVISTON		AVISTON, VILLAGE
129	WQBR931	BREESE RD	AVISTON		AVISTON, VILLAGE
130	WQBR931	END OF LOGAN ST.	AVISTON		AVISTON, VILLAGE
131	KD26236				BARTELSO
132	WQDE208	111 LYLE STREET	HOFFMAN		BASSEN, DAVID
133	WQDE208		HOFFMAN		BASSEN, DAVID
134	KCO368	610 LOUIS ST	BECKEMEYER		BECKEMEYER
135	WPDC657				BECKEMEYER
136	WPNT915	610 LOUIS ST	BECKEMEYER		BECKEMEYER
137	WPNT915		BECKEMEYER		BECKEMEYER
138	KBZ451	16701 ST RT 127	CARLYLE		BEELMAN TRUCK
139	WPPC529	810 FRANKLIN ST	CARLYLE		BOND, COUNTY OF
140	WPVV957	.5 MI S	HOFFMAN		BORDERCOMM
141	WQCN459	110 N CHERRY	HOFFMAN		BRAMMEIER, LARRY

ID	NAME	ADDRESS	CITY	CLASS	OWNER
142	WQCN459		HOFFMAN	CDFLT	BRAMMEIER, LARRY
143	KSE495	300 PRAIRIE ST	GERMANTOWN	CDFLT	GERMANTOWN
144	WPTW838	401 WALNUT STREET	GERMANTOWN	CDFLT	GERMANTOWN
145	WPTW838		GERMANTOWN	CDFLT	GERMANTOWN
146	WNPE666		NEW	CDFLT	GRAUL, KENNETH
147	KVP576	105 SOUTH OAK STREET	HOFFMAN	CDFLT	HOFFMAN FIRE
148	WPNT323	105 S OAK ST	HOFFMAN	CDFLT	HOFFMAN FIRE
149	WPNT323		HOFFMAN	CDFLT	HOFFMAN FIRE
150	WNYL506	3.25 MI W	CENTRALIA	CDFLT	HOYLETON RURAL
151	WNPC998	RR 3 1 HUELS LN	CARLYLE	CDFLT	HUELS, RON
152	WNPC998		CARLYLE	CDFLT	HUELS, RON
153	KVZ458	250 N RAILROAD ST	HUEY	CDFLT	H F BOULDER FIRE
154	KVZ458	19128 BOULDER RD	BOULDER	CDFLT	H F BOULDER FIRE
155	WPWU654	4107 LEE ROAD	TRENTON	CDFLT	HUSTEDDE, PAUL
156	WPWU654		TRENTON	CDFLT	HUSTEDDE, PAUL
157	KRG286	CR 2900N 1 1/4 MI N	SHATTUC	CDFLT	IL BELL
158	WLL573	651 8TH ST	CARLYLE	CDFLT	IL BELL
159	KZW807	JAMESTOWN RD	BREESE	CDFLT	IL HOSPITAL
160	KDZ716	CENTRAILIA CORRECTIONAL CENTER	CENTRALIA	CDFLT	ILLINOIS, STATE OF
161	KKD316	MURRAY DEVELOP CENT 1717	CENTRALIA	CDFLT	ILLINOIS, STATE OF
162	KKD326	MURRAY DEVELOP CENT 1717	CENTRALIA	CDFLT	ILLINOIS, STATE OF
163	KNBF360	CENTRALIA CORRECTIONAL CENTER	CENTRALIA	CDFLT	ILLINOIS, STATE OF
164	KNFQ648	CENTRALIA CORRECTIONAL CENTER	CENTRALIA	CDFLT	ILLINOIS, STATE OF
165	KSN260	ELDON HAZLETT STATE PARK 3 MI N	CARLYLE	CDFLT	ILLINOIS, STATE OF
166	WPBV727	1351 RIDGE	CARLYLE	CDFLT	ILLINOIS, STATE OF
167	WPNY601	CENTRALIA CORRECTIONAL CENTER	CENTRALIA	CDFLT	ILLINOIS, STATE OF
168	WPNY601		CENTRALIA	CDFLT	ILLINOIS, STATE OF
169	WQAR972		BREESE	CDFLT	JERRYS
170	KUC903	2.8 MI. NORTH OF BREESE CITY CENTER	BREESE	CDFLT	JOPLIN BEEPERS
171	WRL339	1/4 MI N OF JCT S RR & JOLLIFF BRIDGE RD	CENTRALIA	CDFLT	KLL Corp
172	WRL339		CENTRALIA	CDFLT	KLL Corp
173	WQX291	8307 MAIN ST	SAINT	CDFLT	KOHLBRECHER
174	WPZQ375	3 MI S	NEW	CDFLT	KRAUSZ, MARK C
175	WPZQ375		NEW	CDFLT	KRAUSZ, MARK C
176	WNRI688	1/2 MI S OF IL RT 161 ON RT 160	NEW	CDFLT	LOOKINGGLASS
177	WPEC738	US CORPS OF ENGINEERS TOWER SITE	CARLYLE	CDFLT	MEDSTAR
178	WPEC738		CARLYLE	CDFLT	MEDSTAR
179	WPXG657	801 Lake Rd	CARLYLE	CDFLT	MEDSTAR
180	WPXG657		CARLYLE	CDFLT	MEDSTAR
181	KNNQ779			CDFLT	METRO AG WASTE
182	KNDN226	1.4 MILES W OF AND .5 N	CENTRALIA	CDFLT	MOBIL PIPELINE
183	KSB918	.5 MI S	HOFFMAN	CDFLT	Natural GasComp
184	KSF589	100 E HANOVER	NEW BADEN	CDFLT	NEW BADEN
185	KSF589		NEW BADEN	CDFLT	NEW BADEN
186	KYB919	1 E HANOVER	NEW BADEN	CDFLT	NEW BADEN
187	WNCN608		NEW BADEN	CDFLT	NEW BADEN
188	WNNQ363		NEW BADEN	CDFLT	NEW BADEN
189	WNNQ363		NEW BADEN	CDFLT	NEW BADEN
190	KNKA218	BREESE SITE: 1400 N COUNTY ROAD	BREESE	CDFLT	New Cingular
191	KNKA218	3232 DAMIANSVILLE ROAD	NEW	CDFLT	New Cingular
192	KNEL927	200 FT E OF HWY JCT 177 AND 160	NEW	CDFLT	NEW
193	WPTG669	5400 FALL RD	ALBERS	CDFLT	NEW MEMPHIS
194	KNDX513	.4 MI W OF CROOKED CREEK MP 60.9 W	CENTRALIA	CDFLT	NORFOLK S
195	WIR64	W OF S COMMERICAL ST	ALBERS	CDFLT	NORFOLK S

ID	NAME	ADDRESS	CITY	CLASS	OWNER
196	WNRQ995	SOU RR MP 48.8W	BARTELSO	CDFLT	NORFOLK S
197	WPVT990	Drive In Rd RR crossing at MP 41.24W	GERMANTOWN	CDFLT	NORFOLK S
198	WPZV776	RT. 161(Slant Rd) RR cross @ MP 047.40W	BARTELSO	CDFLT	NORFOLK S
199	WPZV976	County Line Rd RR cross @ MP 32.49W	NEW	CDFLT	NORFOLK S
200	WQBT797	Beckemeyer Rd RR cross @ RR MP 46.6W	BARTELSO	CDFLT	NORFOLK S
201	WQHE215	Trame Rd RR Crossing @ RR MP 048.81W	East St.	CDFLT	NORFOLK S
202	WQHR257		ALBERS	CDFLT	NORFOLK S
203	WQIJ961	WOODLANE RD RR CROSS @ RR MP 40.25W	ALBERS	CDFLT	NORFOLK S
204	WQIJ961	RAKERS RD RR CROSS @ RR MP 53.18W	HOFFMAN	CDFLT	NORFOLK S
205	WPOU531	0.5 MI S	HOFFMAN	CDFLT	Pathnet, Inc
206	WPCP346		CARLYLE	CDFLT	QUAD COUNTY
207	WNMM446	OLD RT 50 E	BREESE	CDFLT	RIECHMANN BROS
208	WNMM446		BREESE	CDFLT	RIECHMANN BROS
209	WPQA417		CARLYLE	CDFLT	ROY WALKER
210	WPKZ802	9515 HOLY CROSS LANE	BREESE	CDFLT	ST JOSEPH
211	WPKZ802		BREESE	CDFLT	ST JOSEPH
212	WNCT265	HOSPITAL JAMESTOWN RD	BREESE	CDFLT	ST JOSEPH
213	WPGV652	17465 SAINT ROSE RD	TRENTON	CDFLT	ST ROSE
214	WPGV652		TRENTON	CDFLT	ST ROSE
215	WQL944	801 CARLYLE RD, RTE 161	BARTELSO	CDFLT	SANTE FE FIRE
216	WNIC681	1 MI S OF RT 50 1 MI E OF SHATTUC	SHATTUC	CDFLT	SCHAUBERT
217	WNIC681		SHATTUC	CDFLT	SCHAUBERT
218	KAA673	JAMESTOWN RD	BREESE	CDFLT	ST JOSEPH
219	WPGW537	18004 SAINT ROSE RD	SAINT	CDFLT	ST ROSE ELEM
220	WPRR686	16800 OLD US HWY 50	CARLYLE	CDFLT	ST OF IL DEPART
221	WPXW273	119 W. INDIANA STREET	TRENTON	CDFLT	SUGAR CREEK
222	WPXW273		TRENTON	CDFLT	SUGAR CREEK
223	WQY595	1001 W BROADWAY	TRENTON	CDFLT	SUGAR CREEK
224	WNDQ765	IL RT 127 .5 MI S POSEY	CARLYLE	CDFLT	THE MASCHOFFS INC
225	WNDQ765	IL RT 127 .5 MI S POSEY	CARLYLE	CDFLT	THE MASCHOFFS INC
226	WNDQ765		CARLYLE	CDFLT	THE MASCHOFFS INC
227	KRR783	1/4 MI N OF JCT S RR & JOLIFF BRIDGE RD	CENTRALIA	CDFLT	TRACY TRUCKING
228	WQBD900	1161 W. BROADWAY	CENTRALIA	CDFLT	TREASUREISLES
229	KNGS965	14 WEST BROADWAY STREET	TRENTON	CDFLT	TRENTON, CITY OF
230	KNGS965		TRENTON	CDFLT	TRENTON, CITY OF
231	WPXF402	25 WEST INDIANA STREET	TRENTON	CDFLT	TRENTON, CITY OF
232	WPXF402		TRENTON	CDFLT	TRENTON, CITY OF
233	WQHW899	8750 CLINTON COUNTY ROAD	SHATTUC	CDFLT	USCOC OF
234	WQIT870	111 9TH STREET	CARLYLE	CDFLT	USCOC OF
235	WNVT836	1/2 MI E BARTELSO CARL RD 2 MI N 161	CARLYLE	CDFLT	VOSS, JOE
236	WNVT836		CARLYLE	CDFLT	VOSS, JOE
237	KCU458	125-127 N 4TH 50 W	BREESE	CDFLT	WADE SALES &
238	WPNW718			CDFLT	WADE TOWNSHIP
239	KNAL451	1300N-2550E 1/2 MI S ON RT 4	FERRIN	CDFLT	WEDEKEMPERS INC
240	KNDF963	6.5 MI N HWY 50 ON STOLLETOWN RD	CARLYLE	CDFLT	WHEATFIELD FIRE
241	WPXF302	15809 WRING RD	CARLYLE	CDFLT	WHEATFIELD
242	WPXF302		CARLYLE	CDFLT	WHEATFIELD
243	WNGA808	1.4 MI E INT IL RT50 & RT 127 1 MI S 50	CARLYLE	CDFLT	WIEGMANN,
244	WNGA808		CARLYLE	CDFLT	WIEGMANN,
245	WPJH331	4 KM W AND 6.4 KM N OF BREESE IL	SAINT	CDFLT	WILKE, FELIX
246	WPJH331		SAINT	CDFLT	WILKE, FELIX
247	WMF314	W OF S COMMERCIAL ST	ALBERS	CDFLT	WPXS, INC.
248	WPUJ307	300S OF HOLYCROSS LNON	BREESE	CDFLT	BREESE, CITY OF
249	KZV231	CNTY COURT HOUSE	CARLYLE	CDFLT	BREESE, CITY OF

ID	NAME	ADDRESS	CITY	CLASS	OWNER
250	WNKR307	N FIRST ST W OF ELM ST	BREESE	CDFLT	BREESE, CITY OF
251	KZB216	1400 THIRTEENTH ST	CARLYLE	CDFLT	CARLYLE COMM
252	WPGK707	21405 HOPEWELL RD	CARLYLE	CDFLT	CARLYLE N
253	KNDS837	1ST ST & US HWY 50	CARLYLE	CDFLT	CARLYLE, CITY OF
254	WNTJ263	SHATTUC TWR 1.9 KM N	SHATTUC	CDFLT	CENTERPOINT
255	KSB398	475 W MAIN ST	BREESE	CDFLT	CLINTON CO ELE
256	KSB398		BREESE	CDFLT	CLINTON CO ELE
257	KSB398	US ARMY CORPS OF ENGINEERS	CARLYLE	CDFLT	CLINTON COUNTY
258	WPYT638		CENTRALIA	CDFLT	COMM COLLEGE
259	WPUI867		ALBERS	CDFLT	ALBERS ELEM
260	WQFL925	350 S Hull Street	AVISTON	CDFLT	AVISTON SCHOOL
261	KFJ718	LUMBERYARD OFC CLEMENT AVE	AVISTON	CDFLT	AVISTON LUMBER
262	WQBR931	SCHUMACHER RD	AVISTON	CDFLT	AVISTON, VILLAGE
263	KCO368		BECKEMEYER	CDFLT	BECKEMEYER
264	WPUJ307	500 N 1ST STREET	BREESE	CDFLT	BREESE, CITY OF
265	WQGV812		CARLYLE	CDFLT	GOVERNORS RUN
266	WNPE666	3/4 MI S OF RT 177 & RT 160 JCT	NEW	CDFLT	GOVERNORS RUN
267	WNTB934	INT OF 3RD ST & FAIRFAX ST	CARLYLE	CDFLT	IL MUNICIPAL ELE
268	WQAR972	13122 STOLLETOWN	BREESE	CDFLT	JERRYS
269	WNRI688		NEW BADEN	CDFLT	LOOKINGGLASS
270	WNCN608	1 E HANOVER	NEW BADEN	CDFLT	NEW BADEN
271	WNNQ363	1 E HANOVER	NEW BADEN	CDFLT	NEW BADEN
272	KNKA218	HUEY CELL SITE: 310 HUEY STREET	HUEY	CDFLT	New Cingular
273	KNKA218	LOT 5 OF BLOCK T	CARLYLE	CDFLT	New Cingular
274	KTH443	275 FT W OF S COMMERCIAL ST	ALBERS	CDFLT	NORFOLK S

Dams Report

ID	Name	River	City	Owner	Purpose	Height (ft)
1	CB & Q RAILROAD RESERVOIR	CROOKED CREEK-OFFSTREAM	CENTRAL CITY-	CB & Q Railroad	R	19
2	SPORTSMAN LAKE DAM	TRIB SUGAR CREEK	DAMIANSVILLE	Illinois Wildlife Federat	R	23
3	ROCKY FORD POND DAM	SUGAR CREEK-OFFSTREAM	DAMIANSVILLE	Pat Netemeyer, Virgil	R	28
4	LAKE JOY DAM	TRIB LITTLE YORK BRANCH	POSEY-	Okaw Valley Boy	R	23
5	JENNIFER CREEK RESERVOIR DAM	JENNIFER CREEK	NONE	HUNT-LIMA	CO	70
6	NO.2 MINE		ALBERS	MONTEREY COAL	S	0
7	NO.2 MINE		ALBERS	MONTEREY COAL	S	0
8	NO.2 MINE		ALBERS	MONTEREY COAL	T	50
9	NO.2 MINE		ALBERS	MONTEREY COAL	T	60
10	DEIBERT POND DAM	TRIB-SUGAR CREEK	TRENTON	CLARENCE DEIBERT	RF	30

EOC Facilities Report

ID	Name	Address	City	Class
1	Clinton County EOC	830 Franklin Street	Carlyle	EDFLT

FireStation Facilities Report

ID	Name	Address	City	Class	Stories
1	New Baden Fire Dept	100 E Hanover St	New Baden	EFFS	666
2	Sugar Creek Township Fire	1001 W Broadway	Trenton	EFFS	666
3	Hoffman Fire Protection District	105 S Oak	Hoffman	EFFS	666
4	Germantown Fire Protection	306 Prarie St	Germantown	EFFS	666
5	Clin-Clair Fire Protection District	406 W Hwy 161	Albers	EFFS	666
6	Carlyle City Fire Dept	470 11th St	Carlyle	EFFS	666
7	Breese Fire Dept	50 N Germantown Rd	Breese	EFFS	666
8	Breese Ambulance Svc	500 N 1st St # T	Breese	EFFS	666
9	Santa Fe Fire Protection District	801 Carlyle Rd	Bartelso	EFFS	666
10	Aviston Fire Protection District	99 W 1st	Aviston	EFFS	
11	Beckemeyer-Wade Fire	610 Louis	Beckemeyer	EFFS	
12	St Rose Volunteer Fire	17901 St Rose Road	St Rose	EFFS	
13	Huey-Ferrin-Boulder Fire District	250 North Railroad Street	Huey	EFFS	

Hazardous Materials Report

ID	Name	Address	City	Class	EPAID	ChemicalName
1	PULSAR PLASTICS INC.	26TH & FRANKLIN ST.	CARLYLE	HDFLT	ILD150202570	METHYL ETHYL
2	SYMONS	530 MADISON AVE.	JUNCTION CITY	HDFLT	ILD075888743	"1,2,4-
3	SYMONS	530 MADISON AVE.	JUNCTION CITY	HDFLT	ILD075888743	ETHYLBENZENE
4	SYMONS	530 MADISON AVE.	JUNCTION CITY	HDFLT	ILD075888743	STYRENE
5	SYMONS	530 MADISON AVE.	JUNCTION CITY	HDFLT	ILD075888743	XYLENE (MIXED
6	SYMONS	530 MADISON AVE.	JUNCTION CITY	HDFLT	ILD075888743	DICHLOROMETHANE
7	SYMONS	530 MADISON AVE.	JUNCTION CITY	HDFLT	ILD075888743	CUMENE
8	SYMONS	530 MADISON AVE.	JUNCTION CITY	HDFLT	ILD075888743	DIISOCYANATES

Medical Care Facilities Report

ID	Name	Address	City	Class	Function	Beds	Stories	ReplaCost
1	ST JOSEPH'S HOSPITAL	9515 HOLY CROSS LANE	BREESE	EFHM	Hospital	57		7770
2	Aviston Countryside Manor	450 West 1st Street	Aviston	EFHM	Nursing	97	0	
3	Aviston Terrace	349 West First Street	Aviston	EFHS	Nursing	16		
4	Breese Nursing Home	1155 North First Street	Breese	EFHL	Nursing	112		
5	Carlyle Healthare Center	501 Clinton Street	Carlyle	EFHL	Nursing	119		
6	Westlake Home	2090 West Lake Drive	Carlyle	EFHS	Nursing	16		
7	Brookside Manor	1740 West McCord	Centralia	EFHM	Nursing	49		
8	Colonial Apartments	920 West Fourth	Centralia	EFHS	Nursing	16		
9	Warren G Murray	1535 West McCord	Centralia	EFHL	Nursing	376		
10	Clinton Manor Living Center	111 East Illinois Street	New Baden	EFHM	Nursing	90		
11	Clinton Manor Living Center	111 East Illinois Street	New Baden	EFHM	Nursing	50		
12	Royal Living Center Inc.	200 South 9th Street	New Baden	EFHS	Nursing	16		
13	Oakview Home	420 East Second Street	Trenton	MDFLT	Nursing	16		

Natural Gas Facilities Report

ID	Name	Address	City	Class	Function
1	NATURAL GAS PIPELINE CO	HALF MI S OF IL161 ON BROADWAY	HOFFMAN	GDFLT	1209.9
2	NATURAL GAS PIPELINE CO.	SOUTH OF ROUTE 161 BROADWAY	HOFFMAN	GDFLT	1209.9
3	SHATTUC COMPRESSOR	SE OF HWY 50 ON 1200 N	SHATTUC	NGC	1209.9

Police Station Facilities Report

ID	Name	Address	City	Class	Stories
1	New Baden Police Dept	100 E Hanover St	New Baden	EFPS	1554
2	Trenton Police Dept	25 W Indiana St	Trenton	EFPS	1554
3	Germantown Police Dept	306 Prairie St	Germantown	EFPS	1554
4	Breese Police Dept	500 N 1st St	Breese	EFPS	1554
5	Clinton County Sheriff Dept	810 Franklin St	Carlyle	EFPS	1554
6	Carlyle Police Dept	850 Franklin St	Carlyle	EFPS	1554
7	Albers Police Dept	206 W Dwight	Albers	EFPS	1554
8	Aviston Police Dept	149 S Page St	Aviston	EFPS	1554
9	Beckemeyer Police Dept	191 E 1st	Beckemeyer	EFPS	1554

Potable Water Facilities Report

ID	Name	Address	City	Class	Function
1	AVISTON WTP	SW 1/4 SEC 19 T2N R4W	AVISTON	36963	
2	ST. ROSE PUBLIC WATER	ROUTE 50	BREESE	36963	
3	BREESE-WTP	US ROUTE 30 AT SHOAL CREEK	Breese		
4	Water Tower	Boulder Rd & Colles Creek			
5	Carlyle Water Tower	Water Tower Road	Carlyle		
6	Breese Water Tower	Elewood Rd	Breese		
7	Breese GS Water Tower	Tower Ct	Breese		
8	Breese Water Tower	N 4th st & N Gerdes St	Breese		
9	Germantown Water Tower GS	West st & Clinton St	Germantown		
10	Germantown Water Tower	Walnut St & Prairie St	Germantown		
11	Aviston Water Tower	Railroad st	Aviston		
12	Daminasville Water Tower	W Main St & Parish Ln	Damiansville		
13	Daminasville Water Tower	5484 Fall Rd	Damiansville		
14	G Storage Tank	Water Tower Rd& Surge Rd			

School Facilities Report

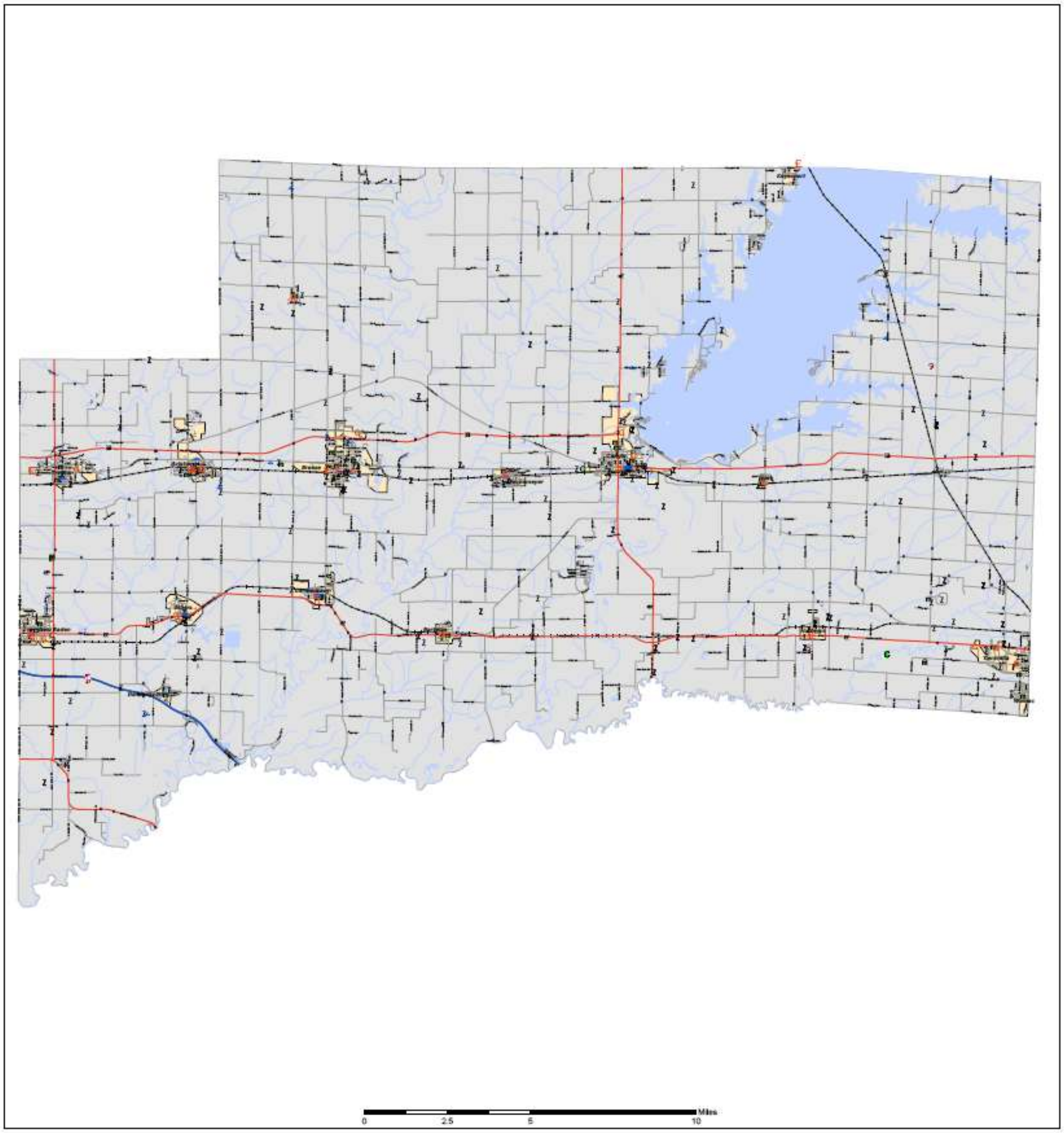
ID	Name	Address	City	Class	Students	Stories
1	MATER DEI M S	900 N MATER DEI DR	BREESE	EFS1	515	555
2	TRINITY LUTHERAN SCHOOL	PO BOX 200 8701 HUEY ROAD	HOFFMAN	EFS1	84	555
3	ALL SAINTS ACADEMY	295 N CLINTON ST	BREESE	EFS1	352	555
4	KASKASKIA EDUCATION	1535 W MCCORD ELM	CENTRALIA	EFS1	15	555
5	CENTRAL COMM HIGH SCHOOL	7740 OLD US HWY 50	BREESE	EFS1	594	555
6	BREESE ELEM SCHOOL	1100 N 7TH ST	BREESE	EFS1	410	555
7	CARLYLE ELEMENTARY	951 6TH ST	CARLYLE	EFS1	516	555
8	CARLYLE HIGH SCHOOL	1461 12TH ST	CARLYLE	EFS1	380	555
9	CARLYLE JUNIOR HIGH SCHOOL	1631 12TH ST	CARLYLE	EFS1	380	555
10	SCHILLER ELEM SCHOOL	800 W 4TH ST	CENTRALIA	EFS1	216	555
11	DAMIANSVILLE ELEM SCHOOL	101 E MAIN	DAMIANSVILLE	EFS1	123	555
12	Albers Elementary School	206 N Broadway St	Alberts	SDFLT	193	555
13	Aviston Elementary	350 S Hull St	Aviston	SDFLT	363	555
14	ST ROSE ELEM SCHOOL	18004 ST ROSE RD	ST ROSE	EFS1	185	555
15	ST GEORGE ELEM SCHOOL	317 E MAPLE ST	NEW BADEN	EFS1	122	555
16	ST MARYS ELEM SCHOOL	313 S ADAMS ST	TRENTON	EFS1	136	555
17	TRENTON ELEM SCHOOL	308 N WASHINGTON ST	TRENTON	EFS1	238	555
18	WESCLIN JR HIGH SCHOOL	10003 STATE RT 160 S	TRENTON	EFS1	190	555
19	WESCLIN SR HIGH SCHOOL	10003 STATE RT 160 S	TRENTON	EFS1	423	555
20	NEW BADEN ELEMENTARY	700 MARILYN DR	NEW BADEN	EFS1	310	555
21	NORTH WAMAC GRADE	1500 CASE ST	CENTRALIA	EFS1	127	555
22	WILLOW GROVE ELEM	815 W 7TH ST	CENTRALIA	EFS1	173	555
23	Germantown Elem School	401 Walnut St	Germantown	EFS1	273	555

24	Bartelso Elementary	306 S Washington	Bartelso	SDFLT	152	555
25	Beckemeyer Elementary	110 Louis St	Beckemeyer	SDFLT	192	555
26	Christ Our Rock High School	9545 Shattuc Rd	Centralia	SDFLT	65	555

WasteWater Facilities Report

ID	Name	Address	City	Function	Class
1	ALBERS STP, VILLAGE OF	310 E. RAILROAD STREET	ALBERS	STP	CDFLT
2	AVISTON STP, VILLAGE	EAST THIRD STREET	AVISTON	STP	CDFLT
3	BARTELSO STP,	603 LINCOLN STREET	BARTELSO	STP	CDFLT
4	BECKEMEYER STP,	191 EAST 1ST STREET	BECKEMEYER	STP	CDFLT
5	BREESE STP, CITY OF	SOUTH BROADWAY	BREESE	STP	CDFLT
6	CARLYLE STP, CITY OF	850 FRANKLIN STREET	CARLYLE	STP	CDFLT
7	DAMIANSVILLE STP,	CLINTON COUNTY HIGHWAY 8	ALBERS	STP	CDFLT
8	GERMANTOWN STP,	808 LAKE PARK DRIVE	GERMANTOWN	STP	CDFLT
9	HICKORY SHORES	21925 DOVE LANE	CARLYLE	CAMPSITE	CDFLT
10	HOFFMAN STP, VILLAGE	1 MILE N/NE OF HOFFMAN	HOFFMAN	STP	CDFLT
11	HUEY STP, VILLAGE OF	VILLAGE HALL	HUEY	STP	CDFLT
12	NEW BADEN SEWAGE	R.R. 3/4 MILE EAST OF VILLAGE	NEW BADEN	STP	CDFLT
13	NEW MEMPHIS SD STP	PO BOX 205	NEW MEMPHIS	STP	CDFLT
14	SAINT ROSE SD STP	7975 CEMETERY ROAD	SAINT ROSE	STP	CDFLT
15	TRENTON SEWAGE	NORTH OAK STREET	TRENTON	STP	CDFLT
16	WESCLIN HIGH SCHOOL	10003 STATE RT 160 S	TRENTON	HIGHSCHOOL	CDFLT

Appendix G—Map of Critical Facilities



Clinton County
Pre-Disaster Mitigation Plan

Critical Facilities Map

2

Legend

- Care Facility
- Emergency Operation Center
- Fire Station
- Police Station
- School
- Communication Facility
- Dams
- Electric Power Facility
- Hazardous Material
- Natural Gas Facility
- Potable Water Facility
- Wastewater Facility
- Insterstate
- State Road
- Local Road
- Railroad
- Bridge
- River
- Lake
- City

Southwestern Illinois Metropolitan
& Regional Planning Commission
2511 Vandalia Street
Collinsville, IL 62234
Phone: (618) 344-4250
Fax: (618) 344-4253

Data Sources: U.S. Geologic Survey; Illinois Department of Health; Federal Communications Commission(FCC); Federal Aviation Administration(FAA); Illinois State Fire Marshall; Federal Emergency Management Agency(FEMA); Environmental Protection Agency (EPA); US Army Corps of Engineers; Illinois Department of Transportation; Clinton County E911; Clinton County GIS Office

Appendix H—Recorded NOAA Flood Data: USGS Stream Gauge Data

Appendix H – Top ten flood flows from the USGS Stream Gauge Data

County Station River Period of Record Latitude Longitude	Clinton County Near Posey, IL Crooked Creek 1968-1974 38°31'08" 89°21'08"		Clinton County Near Carlyle, IL Kaskaskia River 1908-2007 38°36'42" 89°21'22"		Clinton County Near Breese, IL Shoal Creek 1910-2007 38°36'36" 89°29'41"	
Rank	**Date**	**Discharge (cfs)**	**Year**	**Historical Crests (ft)**	**Date**	**Discharge (cfs)**
1	12/22/1968	14,700	1943	436.70	05/19/1943	52,000
2	04/16/1972	11,200	1950	434.20	05/09/2002	23,300
3	01/30/1969	10,400	1961	434.10	01/06/1950	23,100
4	03/11/1973	8,600	1957	433.60	06/17/1957	22,600
5	12/26/1974	8,310	1938	432.60	03/29/1913	22,000
6	04/24/1970	7,620	1945	430.90	04/14/1979	20,600
7	02/06/1971	2,160	1960	429.80	01/07/2005	17,600
8			1966	428.30	05/10/1961	17,600
9			1969	427.70	05/18/1990	17,400
10			2002	427.21	02/25/1985	15,100

County Station River Period of Record Latitude Longitude	Clinton County Near Albers, IL Sugar Creek 1972-1982 38°32'29" 89°37'36"	
Rank	**Date**	**Discharge (cfs)**
1	02/11/1973	10,500
2	01/31/1982	7,000
3	04/12/1979	5,970
4	02/23/1975	5,170
5	03/29/1977	3,740
6	03/15/1978	3,210
7	01/01/1974	3,170
8	03/30/1980	2,320
9	01/21/1981	1,640